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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 896

Contribution from the Office of Farm Management and Farm Economics
H. C. TAYLOR, Chief

Washington, D. C. November 19, 1920

THE COST OF PRODUCING COTTON

(842 RECORDS—1918)

By

L. A. MOORHOUSE, Associate Farm Economist

and

M. R. COOPER, Assistant Farm Economist

CONTENTS

	Page
Introduction	1
Yield of Cotton in the South	4
Method of Study and Description of Areas	4
Analysis of 1918 Costs	9
Relation of Acreage and Yield to Net Cost Per Pound of Lint	16
Normal Times Required for Various Operations	17
Farm Receipts	41
Basic Cost Factors	42
Variations in Cost and Relation to Price	45
Appendix	50

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	Page.		Page.
Introduction	1	Normal time required for various operations	17
Yield of cotton in the south	4	Farm receipts	41
Method of study and description of areas	4	Basic cost factors	42
Analysis of 1918 costs	9	Variations in cost and relation to price	45
Relation of acreage and yield to net cost per pound of lint	16	Appendix	50

INTRODUCTION.

This bulletin is based upon estimates from 842 farms representing 10 districts in the Cotton Belt, viz: 3 districts in Alabama, 3 in Georgia, 2 in South Carolina, and 2 in Texas. (See fig. 1 and Table I.) The relative importance of the cotton crop in these four States is shown by Table II.[1]

This investigation pertains to the crop year 1918 and the cost figures for each farm are applicable only to the cotton crop of this particular year.

[1] Considerable work has been done by the Office of Farm Management and Farm Economics in the Cotton Belt, and bulletins showing the business organization of farms in typical cotton districts have been published. Farm practices in the cultivation of cotton have also been studied to some extent. See the following Bulletins:

Dept. Bul. 492, "An Economic Study of Farming in Sumter County, Georgia"; Dept. Bul. 511, "Farm Practice in the Cultivation of Cotton"; Dept. Bul. 648, "A Farm Management Survey in Brooks County, Georgia"; Dept. Bul. 651, "A Farm Management Study in Anderson County, South Carolina"; Dept. Bul. 659, "A Farm Management Study of Cotton Farms in Ellis County, Texas"; Dept. Bul. 665, "Status of Farming in the Lower Rio Grande Irrigated District of Texas."

NOTE.—Acknowledgment is due to Messrs. R. S. Washburn, M. A. Crosby, E. S. Haskell, and H. B. McClure, of the Office of Farm Management, United States Department of Agriculture; Mr. F. D. Stevens, of the Alabama College of Agriculture; and Mr. S. H. Starr, of the Georgia College of Agriculture, for assistance in collecting the data which are presented in this bulletin. Acknowledgment is also due Miss Catherine R. Hawley, of the Office of Farm Management and Farm Economics, for careful work in supervising the tabulations which are used as a basis for this discussion. Thanks are extended to the farmers of the respective districts who cooperated so willingly in furnishing information with reference to the cost of producing cotton.

General interest in figures relating to farm costs has been manifested during the past two years. This is especially true with reference to such farm staples as cotton and wheat. However, the real significance of figures of this character is generally missed, while minor features are emphasized to such an extent that the real purpose of the study is forgotten.

It is highly desirable, therefore, to keep in mind some of the limitations of cost figures. The cross section which is here presented for inspection represents a relatively small portion of the total cotton production of the United States. The conclusions which may be drawn from this analysis can be applied to the farms of the Cotton Belt in general only so far as is warranted by similarity of conditions.

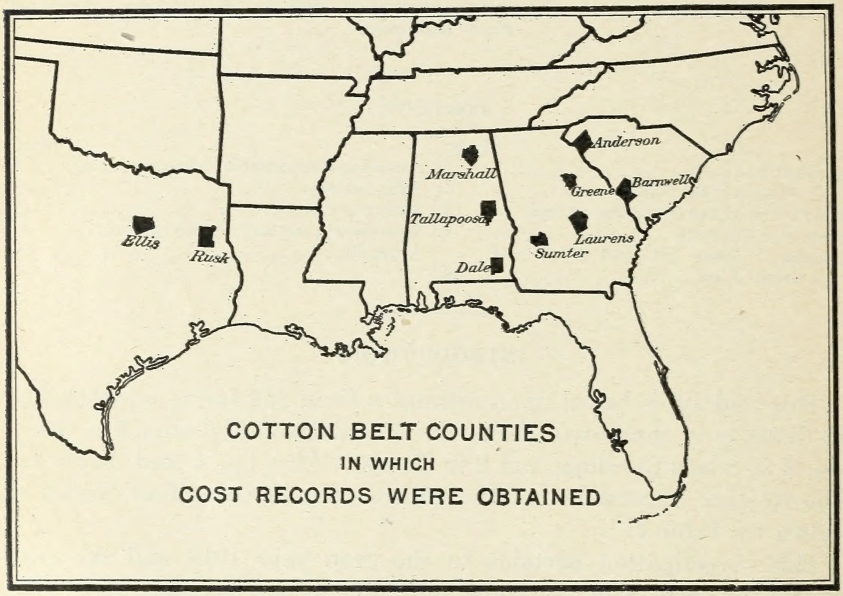

FIG. 1.—Black portions show locations of areas surveyed.

However, a review of the methods followed by these growers will undoubtedly prove suggestive to any cotton grower, and should make for more efficient practices even where conditions differ from those that obtain in the areas surveyed.

The basic factors of production constitute the fundamental data of this report. Money costs fluctuate appreciably, and thus do not provide a satisfactory basis for comparison throughout a period of years. There are items of cost, however, that remain fairly constant from year to year, and these can be used much more effectively than costs reported in dollars and cents. Factors that possess this stability are known as "the basic requirements of production." Such factors include the hours of man and mule labor utilized in

growing the crop; the quantity of seed used; the amount of fertilizer applied per acre; and the quantities used of such other materials as are necessary in growing cotton.

Information as to the hours of labor and the quantities of seed and fertilizer used constitutes the basis upon which good farm organization is built. If we do not know how many hours it takes to grow a given crop, and if no facts have been recorded concerning the distribution of this labor from a seasonal viewpoint, it will not be possible to proceed with the initial steps in bringing about a more efficient management. Furthermore, such information is essential in drawing up new plans which may include the introduction of new enterprises to be carried in connection with the major enterprise of the area.

Cost figures should serve primarily to make for better farm organization and greater profits. These studies have been planned with this end in mind. Cost figures are used in commercial work for the purpose of making adjustments that will greatly enhance the business; they can be applied equally well in the field of agriculture.

TABLE I.—*Distribution of cotton enterprise records (1918 crop).*

State and county.	Area.	Number of records.	Total by State.
Georgia			243
Laurens County	Dublin	85	
Greene County	Greensboro	78	
Sumter County	Americus	80	
Alabama			269
Tallapoosa County	Alexander City	89	
Marshall County	Albertville	90	
Dale County	Daleville-Ozark	90	
South Carolina			180
Anderson County	Belton	89	
Barnwell County	Barnwell-Elko	91	
Texas			150
Ellis County	Waxahachie	75	
Rusk County	Henderson	75	
			842

TABLE II.—*Production of lint (excluding linters) in 500-pound gross weight bales, by States, 1909 to 1918.*[1]

[Thousands of bales, as finally reported by U. S. Bureau of the Census.]

State.	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
Virginia	10	15	30	24	23	25	16	27	19	26
North Carolina	601	706	1,076	866	792	931	699	655	618	870
South Carolina	1,100	1,164	1,649	1,182	1,378	1,534	1,134	932	1,237	1,500
Georgia	1,804	1,767	2,769	1,777	2,317	2,718	1,909	1,821	1,884	2,100
Florida	54	59	83	53	59	81	48	41	38	25
Alabama	1,024	1,194	1,716	1,342	1,495	1,751	1,021	533	518	820
Mississippi	1,083	1,263	1,204	1,046	1,311	1,246	954	812	905	1,210
Louisiana	253	246	385	376	444	449	341	443	639	525
Texas	2,523	3,049	4,256	4,880	3,945	4,592	3,227	3,726	3,125	2,580
Arkansas	714	821	939	792	1,073	1,016	816	1,134	974	935
Tennessee	247	332	450	277	379	384	303	382	240	330
Missouri	45	60	97	56	67	82	48	63	61	70
Oklahoma	545	923	1,022	1,021	840	1,262	640	823	959	550
California		6	10	8	23	50	29	44	58	100
Arizona									22	51
All other	2	4	7	3	10	14	7	14	5	8
United States	10,005	11,609	15,693	13,703	14,156	16,135	11,192	11,450	11,302	11,700

[1] Yearbook, U. S. Department of Agriculture, 1918.

YIELD OF COTTON IN THE SOUTH.

A cost study of this character is designed to give a true picture of representative areas, so that the conclusions drawn may be applicable, not only to the areas in question, but also to contiguous districts where climatic and soil conditions are similar and methods of production are identical or nearly so. The farm costs reported in this bulletin are based upon the actual yields obtained on each farm. It is of interest to compare the yields of lint cotton reported by States in 1918 with the average yields obtained in the districts included in this survey.

The average yield of lint cotton for the 842 farms was 227 pounds per acre. The average yield for all cotton produced in the United States during the year 1918 was 155.9 pounds of lint per acre. The latter average was approximately 20 pounds below the 10-year average 1909 to 1918. It will be seen, therefore, that in 1918 the farms used in connection with this cost study had a higher average return than the normal, and even higher than the 10-year average for the Cotton Belt as a whole. (See p. 16 for discussion of relation of average and yield to production costs.)

TABLE III.—*Yield of cotton per acre, by States.*[1]

State.	Ten-year average, 1909 to 1918.	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
Virginia	247	190	212	330	250	240	265	225	310	180	270
North Carolina	248	210	227	315	267	239	290	260	215	194	265
South Carolina	222	210	216	280	209	235	255	215	160	208	235
Georgia	192	184	173	240	159	208	239	189	165	173	188
Florida	119	110	110	130	113	150	175	120	105	100	78
Alabama	159	142	160	204	172	190	209	146	79	125	160
Mississippi	172	157	182	172	173	204	195	167	125	155	185
Louisiana	165	130	120	170	193	170	165	165	170	210	161
Texas	154	125	145	186	206	150	184	147	157	135	110
Arkansas	182	153	175	190	190	205	196	180	209	170	155
Tennessee	189	158	207	257	169	210	200	188	206	130	168
Missouri	260	271	285	360	260	286	270	240	225	190	215
Oklahoma	160	147	200	160	183	132	212	162	154	165	85
California	385	.....	335	390	450	500	500	380	400	242	265
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	285	280
United States	175.7	154.3	170.7	207.7	190.9	182.0	209.2	170.3	156.6	159.7	155.9
842 farms studied	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	227

[1] Yearbook U. S. Department of Agriculture, 1918.

METHOD OF STUDY AND DESCRIPTION OF AREAS.

A special cotton enterprise schedule was prepared and each grower who was visited gave a detailed report of the man and mule labor required in preparing the land, planting the seed, cultivating and harvesting the cotton. Each operator also estimated the cash expenses and other costs chargeable to cotton. Fairly complete data were obtained with reference to the acreage devoted to crops other than cotton. A comparison of the receipts from cotton lint

and seed with that portion of the farm income that was derived from other crops, as well as from live stock and live-stock products, indicates the relative importance of the various enterprises which are found on these farms. With the exception of one district (Dale County, Ala.), the cotton crop is the outstanding industry in the districts which were selected. The income from cotton and cotton seed constituted from 75 to 93 per cent of the total farm receipts in nine districts, while in Dale County, Ala., 45 per cent of the total farm receipts came from cotton, and 35 per cent from peanuts. Naturally, cotton receives first consideration in the management and operation of most of these farms.

CLIMATIC CONDITIONS.

In Ellis County, Tex., there was an increase in the average precipitation for 1918 in comparison with the mean annual rainfall. However, this excess occurred mainly in October, November, and December. The rainfall for the early part of the season was below normal. For many sections of the State there was a deficiency in precipitation during the first nine months of the year. In Alabama there was a wide range in both temperature and rainfall during the year 1918. Comparatively low yields of cotton were reported for the three Alabama districts. Dry weather was a characteristic feature of the growing season in Georgia, yet this was not reflected in the average annual precipitation for 1918. The yields of cotton were above the average in the districts surveyed. There were also wide seasonal fluctuations in South Carolina, but these conditions did not work to the disadvantage of the cotton grower in the areas represented in this study.

SOILS.

Laurens and Sumter Counties, Ga., are situated in the coastal plain area. These two districts represent the central and southwestern parts of the State. The soils in Laurens County are sandy in the surface portion and have sandy clay subsoils. Norfolk sand is the most important soil type in this county. In Sumter County the soils are mainly sandy in character, the prevalent types being Greenville loamy sand and sandy loam. In Tallapoosa County, Ala., the Cecil type is found. Such soils as Cecil stony, sandy loam, Cecil stony loam, Cecil slate and sandy loams are the outstanding members of this group. Dale County, Ala., is represented by such well-known soil types as Norfolk sand and Susquehanna fine sandy loam, while in Marshall County, the DeKalb silt loam and the DeKalb fine, sandy loam are types that cover rather extensive areas. Anderson County, S. C., is situated in the upper Piedmont area. In this district the Cecil sandy loam is the most common type, while Cecil clay stands second. Barnwell County is within the coastal plain area and it possesses such types as the Norfolk sand and the Norfolk sandy loam.

It may be observed that in all these areas commercial fertilizers are used quite extensively. Ellis County, Tex., which possesses a soil type known as Houston black clay, did not report any expense for fertilizers used in cotton production. Rusk County, Tex., has at least three well-defined soil types; namely, the Orangeburg fine sand, Norfolk fine sand, and the Susquehanna fine sandy loam. It will be seen that practically all districts contain soils of the lighter types. Many of these types are deficient in organic matter. The practice of growing legumes, such as the velvet bean, cow peas, and peanuts between the rows of corn has given excellent results, and greater interest will be manifested in these crops as the benefits come to be understood more clearly.

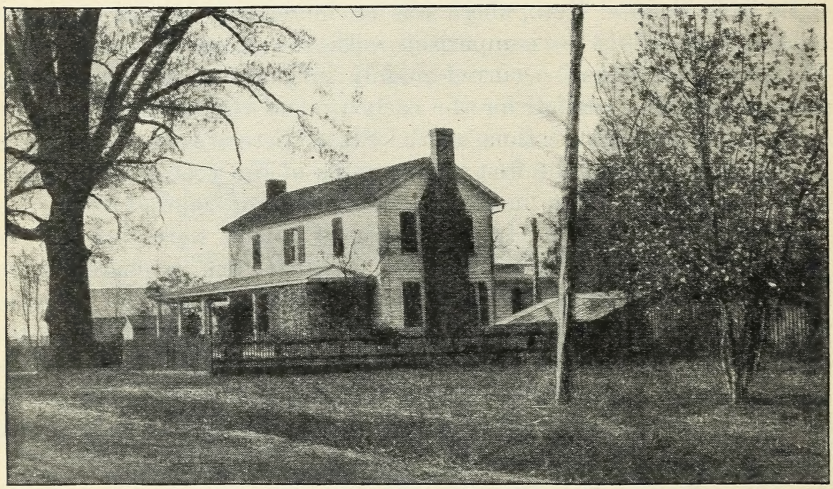

FIG. 2.—A cotton planter's home, Anderson County, S. C.

SIZE OF FARMS.

Recent information is not available with respect to size of farms in the counties which were selected for this investigation. However, the Thirteenth Census gives a detailed report on the size of farms for these counties during the year 1909. Therefore, these figures have been used for comparison with the farms upon which cost estimates were obtained. Table IV contains two columns, one giving the size of all farms in each county by groups, and the other showing the distribution of the 842 records in accord with the size-groups established by the Census Bureau. In the census classification a cropper farm is considered as a unit, and not as a part of a plantation, as in the classification followed in this survey. This undoubtedly accounts for the relatively large numbers which the census reports show for the size-group including farms from 20 to 49 acres. There are 148 farms, or 17.5 per cent of the total number of farms surveyed, which fall within the group of 20 to 49 acres. More than 50 per cent of the records will

be found within two size-groups embracing farms from 50 to 99 acres and farms of 100 to 174 acres. The records in these two groups are equally divided, there being 233 farms within each class. A limited number of the very large farms or plantations were visited and records obtained therefrom. It will be seen that very small farms have been omitted.

TABLE IV.—*Comparison of groups by size of farms (thirteenth census), with farms studied.*[1]

Size of farm.	Georgia.						Alabama.					
	Laurens County.		Greene County.		Sumter County.		Tallapoosa County.		Marshall County.		Dale County.	
	Census.	Survey.	Census.	Survey.	Census.	Survey.	Census.	Survey.	Census.	Survey.	Census.	Survey.
Under 3 acres	2	.....	.....	.....	1	.....	.....	.....	2	.....	1	.....
3 to 9 acres	61	.....	160	.....	24	.....	161	.....	178	.....	67	.....
10 to 19 acres	118	.....	232	.....	57	.....	493	.....	659	.....	131	.....
20 to 49 acres	2,581	8	1,144	6	1,578	5	1,839	13	1,917	51	1,390	20
50 to 99 acres	1,125	23	636	23	591	14	1,149	18	1,210	28	758	25
100 to 174 acres	540	25	442	16	342	30	795	23	623	10	631	22
175 to 259 acres	239	12	118	12	160	13	274	11	177	.....	256	11
260 to 499 acres	176	12	70	9	109	11	175	16	104	1	164	6
500 to 999 acres	57	5	23	7	44	7	34	8	19	.....	26	4
1,000 acres and over	24	.....	5	5	23	.....	9	.....	4	.....	4	2

Size of farm.	South Carolina.				Texas.			
	Anderson County.		Barnwell County.		Ellis County.		Rusk County.	
	Census.	Survey.	Census.	Survey.	Census.	Survey.	Census.	Survey.
Under 3 acres	11	.....	1	.....	1	.....	.....	.....
3 to 9 acres	310	.....	210	.....	63	.....	72	.....
10 to 19 acres	1,100	1	153	.....	171	.....	313	.....
20 to 49 acres	3,611	24	1,927	18	1,084	.....	1,560	3
50 to 99 acres	2,022	40	888	25	2,264	17	1,322	20
100 to 174 acres	809	20	462	24	1,777	32	1,029	31
175 to 259 acres	181	1	206	13	287	15	241	14
260 to 499 acres	102	1	176	10	132	10	299	7
500 to 999 acres	15	1	82	1	14	1	50	.....
1,000 acres and over	2	1	40	.....	8	.....	8	.....

[1] It should be borne in mind that in this survey a cropper's land is considered as part of the owners' farm, while in the census classification each cropper farm is considered a farm unit.

TENURE.

For classification on the basis of tenure, the 842 records have been divided into two classes, namely, white farmers and colored farmers. Within these two groups will be found owners, that is, men who own and direct the operation of their farms; "owners additional," or men who operate some rented land in addition to the farm land held under direct ownership; "owners, part rented out," men who operate part of their land and rent out the rest for a specified share of crop or cash payment. The latter arrangement may apply to owners additional and also to tenants. The tenant group includes men who furnish all labor and equipment and direct the entire oper-

ation of the farm, paying the landlord a cash rent or a specified amount of cotton. (See Table V.)

Approximately 40 per cent of the men interviewed were white owners. The second largest group, comprising 25 per cent of the records, was that of the white tenants. These two groups taken together constitute 65 per cent of the 842 records.

Wage and cropper cotton.—A large proportion of the cotton crop is produced by two classes of labor, namely, wage hands and croppers. Both of these classes of labor are under the direct supervision of the farm owner or farm operator. Wage hands receive their compensation for the labor performed in a stipulated daily, monthly, or annual payment in cash, whereas croppers are sometimes treated as farm operators, but in reality they should be considered as wage hands who receive their compensation in a share of the crop. The cropper furnishes labor; he is provided with equipment by the owner of the land.

In assuming that the cost of cropper cotton to the operator equals the amount paid to the cropper for his share of the crop, we must take into consideration the fact that a margin above the going wage rate may accrue to the cropper as return for the risk he assumes, especially when the price of cotton is high, as was the case with the crop with which this study is concerned. This margin, which accrues to the cropper, must be counted as cost to the operator, since to him the cost of cropper cotton is essentially that part of the crop necessary to provide this class of labor. Thus there enters an anomalous factor, which it has been found impossible to eliminate, since to assume a labor cost for cropper cotton at the current rate for cotton wage hands would be to assume something contrary to fact. There is no reason to believe that men would be available for cropper farming unless they thought they stood to make more than the going wage.

TABLE V.—*Tenure of farms (842 records).*

	Records.	
	Number.	Per cent.
White:		
Owners	335	39.8
Owners, additional	43	5.1
Owners, part rented out	128	15.2
Owners additional, part rented out	7	.8
Tenants	211	25.0
Tenants, part rented out	14	1.7
	738	87.6
Colored:		
Owners	19	2.2
Owners additional	4	.5
Owners, part rented out	8	1.0
Tenants	72	8.6
Tenants, part rented out	1	.1
	104	12.4
Total	842	100

In view of this consideration, it becomes apparent that the cost figures here presented can not properly be used as a basis for determining a fair selling price, since in that case the price of cotton would become an element in its cost with the result that the higher the price, the higher would go the cost, and the higher the cost, the higher the price, and so on, ad infinitum.

ANALYSIS OF 1918 COSTS.

In summarizing production costs they have been divided into three groups; namely, "labor costs," including man and mule labor; "material costs," such as seed and fertilizer, etc., and "other costs," embracing such items as use of land, use of machinery, etc.[1]

MAN LABOR.

Each grower visited gave a detailed estimate of the value of all farm labor utilized in the operation and management of the farm during the year 1918. This statement showed the total value of all family labor employed upon productive enterprises, the total value of all wage labor, and the total expense for labor performed upon a contract basis. The cost per unit of product is given for each farm irrespective of tenure. Cropper cotton and wage cotton on owned and rented farms have been combined in this analysis. Cropper labor was charged at the actual value for the share of the cotton received. A small amount of supervision was included with the total of the labor which has been specified. The man labor costs for the entire farm, as determined by bringing the above classes together, were distributed to the crop and live-stock enterprises on the basis of receipts from the respective enterprises. Inasmuch as cotton was the outstanding enterprise in each district, the bulk of the man labor costs for the farm as a whole was apportioned to cotton. The rate for man labor approximated 30 cents per hour in this study.

MULE LABOR.

No attempt was made to secure estimates for each farm on the cost of keeping work stock, nor did the schedule contain any questions relating to the number of days of actual work performed by mule or horse labor during the year. To approach the problem from this standpoint a special study would be necessary. A careful record was made of the mule or horse labor required with each field operation in growing and marketing the cotton crop. These data were

[1] It has been shown that some very striking differences existed in the unit costs that were determined for individual farms in the several districts visited. By bringing together the farms in each district and securing an average for this group, a comparison can be made with group averages in other areas. Such a comparison reveals the fact that quite marked differences are also apparent between several of the groups used in this study. In order to obtain a complete explanation for some of these group variations, it will be necessary to review the prevailing practices which were employed by cotton growers in the districts represented. Methods of cotton culture are discussed in a section of this bulletin which deals with the normal man and mule labor requirements.

taken by operations and the mule or horse labor is therefore recorded in hours. The total hours of mule labor in all work of growing cotton was multiplied by a rate of 12 cents per hour in order to determine the total mule labor costs in money. (See Table VI.)

TABLE VI.—*Summary of labor costs (842 records).*

State and county.	Number of records.	Total number acres in cotton.	Yield of lint per acre.	Labor cost per acre.			Labor cost per pound of lint.
				Man.	Mule.	Total.	
Georgia:			*Pounds.*				
Laurens County	85	3,968.0	277	$45.09	$7.22	$52.31	$0.1887
Greene County	78	4,147.5	260	43.39	7.15	50.54	.1945
Sumter County	80	4,188.5	244	32.78	7.66	40.44	.1657
Alabama:							
Tallapoosa County	89	1,169.0	172	47.41	7.10	54.51	.3163
Marshall County	90	1,249.5	227	50.76	7.12	57.88	.2554
Dale County	90	1,226.5	194	40.96	6.42	47.38	.2445
South Carolina:							
Anderson County	89	2,865.5	248	43.41	6.80	50.21	.2026
Barnwell County	91	3,935.5	268	41.52	7.51	49.03	.1832
Texas:							
Ellis County	75	8,148.0	176	17.51	4.42	21.93	.1242
Rusk County	75	2,568.0	185	29.33	5.89	35.22	.1900

This rate was arrived at in part from estimates obtained in these districts. Consideration was also given to the ratio which exists between mule and horse labor rates and man labor rates. Former studies made by this office from the standpoint of single enterprises have approximately a ratio of 1 to 2. In other words, where a rate of 10 cents per hour for mule or horse labor prevailed in a given district, a rate of 20 cents per hour for man labor was current. In this study the ratio stands 12 cents per hour for mule labor, in contrast with 30 cents per hour for man labor. Table VI contains a summary of the man and mule labor costs for the 10 districts included in this survey.

The lowest acre cost for man and mule labor was found in Ellis County, Tex., while the highest cost for these two items was reported for Marshall County, Ala. The lowest cost for labor, when reduced to a unit basis, was shown for Ellis County, Tex. The highest cost for the respective groups occurred in Tallapoosa County, Ala.

MATERIAL COSTS.

This group of costs takes into consideration cotton seed used in planting, farm manure applied to the land, commercial fertilizer purchased and applied to cotton, and baskets, sacks, or sheets used in harvesting the crop.

SEED.

On many farms the cotton seed used in planting was bought, and in such cases it was an easy matter to determine the total cost of this material. Where the seed was carried over from the preceding crop and was used for planting the 1918 cotton acreage, the value was based upon the market price of seed at the time of planting. The

quantity of seed used was also recorded for reference in connection with a study of the basic requirements of this crop. The latter subject will be treated in the concluding pages of this bulletin.

FERTILIZERS.

The commercial fertilizers which are applied annually to the cotton represent a direct cash expenditure. As a rule, the individual grower has no difficulty in recalling the total cash outlay for this material. He also has very definitely in his mind the number of tons or the number of pounds of fertilizer purchased during the year. If a part of this fertilizer was applied to some crop or crops other than cotton, these amounts were determined and this information aided the operator in arriving at the total amount of fertilizer applied to cotton. The records, therefore, show the total quantity of commercial fertilizer that was applied to cotton and they indicate the cash expenditures which were made in the purchase of this fertilizer.

FARM MANURE.

Farm manure was used only to a limited extent upon cotton land and the total cost for such manure was relatively small. Usually the grower who applies manure can give an accurate estimate relative to the number of loads that were hauled and scattered upon a given field, and each agricultural community has also set up a standard of value for farm manure. With several estimates of this character available, the cost for manure can be approximated quite closely.

BASKETS, SACKS, AND SHEETS.

There is an annual replacement charge for baskets, sacks, and sheets which are used in harvesting the cotton at the end of the growing season. Like the charge for farm manure, this may also be considered as a minor item. Estimates were obtained from each grower upon the annual cash outlay for baskets, sacks, and sheets. Table VII contains a summary of the costs for seed, manure, fertilizer, baskets, sacks, and sheets.

TABLE VII.—*Summary of material costs (842 records).*

State and county.	Number of records.	Total number acres in cotton.	Yield of lint per acre.	Material costs per acre.					Material costs per pound of lint.
				Seed.	Manure.	Fertilizer.	Sacks and sheets.	Total.	
			Pounds.						
Georgia:									
Laurens County	85	3,968.0	277	$1.27	$0.04	$3.85	$0.24	$5.40	$0.0195
Greene County	78	4,147.5	260	1.75	.36	4.17	.18	6.46	.0248
Sumter County	80	4,188.5	244	2.05	.44	4.92	.22	7.63	.0313
Alabama:									
Tallapoosa County	89	1,169	172	1.60	.32	3.07	.18	5.17	.0300
Marshall County	90	1,249.5	227	1.72	1.90	6.43	.25	10.30	.0455
Dale County	90	1,226.5	194	1.69	.39	3.54	.26	5.88	.0303
South Carolina:									
Anderson County	89	2,865.5	248	1.70	.46	5.93	.12	8.21	.0331
Barnwell County	91	3,935.5	268	1.48	.46	11.24	.23	13.41	.0501
Texas:									
Ellis County	75	8,148	176	1.14	.01	.....	.05	1.20	.0068
Rusk County	75	2,568	185	1.12	.02	2.11	.27	3.52	.0190

The average seed cost for the year 1918 varied from $1.12 per acre in Rusk County, Tex., to $2.05 per acre in Sumter County, Ga. The highest acre cost for farm manure occurred in Marshall County, Ala. Fertilizer costs constituted by far the most important single item of expense included under materials. Combined with seed cost, these two items make up the major portion of the expense for materials. No commercial fertilizer was purchased and applied by the Ellis County farmers who gave estimates. The lowest average acre cost for commercial fertilizer was reported for Rusk County, Tex., while the highest average cost, $11.24 per acre, occurred in Barnwell County, S. C. The quantity of fertilizer applied per acre will be considered under the general heading of "Basic requirements."

OTHER COSTS.

"Other costs" embraced such items as interest or land rent, insurance and taxes, machinery charges, and overhead expense. Interest and rent charges may be considered under the heading of "Use of land." In the case of owned farms a conservative estimate was secured with reference to the value of the cotton land. It was found that farmers paid approximately 8 per cent on first-mortgage loans. This rate was used in working out the cost chargeable on owned farms. On rented farms this cost was included in the value of the share of the crop given or in the proportionate share of the cotton rent chargeable to the cotton acreage or in the cash rent actually paid. Very few farms of the cash rent type were found in this survey. Share and cash rent differ from the interest charge on land investment in that the latter cares for the capital invested in cotton land only, while the former is assumed to cover this item as well as such expense as taxes and general upkeep on the farm.

INSURANCE AND TAXES.

The farm owner who pays insurance on farm buildings and taxes which are assessed against the farm must draw upon his sources of income to meet these expenses. Definite information was taken in each case concerning the total amounts paid under the respective headings. The proportion chargeable to cotton was ascertained in each instance and was entered under each heading as a production cost.

USE OF MACHINERY.

Complete inventories were taken of the machinery on each farm; values were given in the case of each implement, and repair costs for the year were carefully estimated. Each operator also indicated the percentage depreciation for the year. He also gave his estimate regarding the proportion of the total machinery expense which should be carried by cotton. All of these phases were taken into account in working out the machinery costs for cotton.

OVERHEAD EXPENSE.

There are certain costs in the operation of a farm that are not directly chargeable to any special enterprise, but they are applicable to the farm as a whole and they must be carried by the respective crop or live-stock enterprises in proportion to the magnitude of these enterprises. Every farm possesses some unproductive land which forms a part of the total capital investment. Interest and taxes must be paid upon this portion of the investment. Furthermore, such items as telephone service, building maintenance, and miscellaneous cash expenses must be apportioned to the farm as a whole. In areas where detailed farm accounting records are available, some suggestions can be made concerning the percentage of the farm expense that does not appear to be directly chargeable to single enterprises, but must be considered under the heading of "Overhead expense." Practically no detailed farm accounting work has been done in the Cotton Belt. Consequently, the necessary facts with reference to percentage of overhead common to typical areas of this region have not been made available. In this study a 10 per cent charge was taken of the total labor and material costs and this was included under the general heading "Overhead expense." Table VIII contains a summary of such costs as use of land, insurance and taxes, use of machinery, and overhead.

TABLE VIII.—*Summary of other costs (842 records).*

State and county.	Number of records.	Total number acres in cotton.	Yield of lint per acre.	Other costs per acre.					Other costs per pound of lint.
				Use of land.	Insurance and taxes.	Machinery.	Overhead.	Total.	
			Pounds.						
Georgia:									
Laurens County	85	3,968.0	277	$7.38	$0.30	$1.69	$5.77	$15.14	$0.0546
Greene County	78	4,147.5	260	7.47	.17	1.64	5.70	14.98	.0576
Sumter County	80	4,188.5	244	6.76	.25	1.62	4.81	13.44	.0551
Alabama:									
Tallapoosa County	89	1,169.0	172	3.10	.13	1.59	5.97	10.79	.0626
Marshall County	90	1,249.5	227	9.32	.25	2.63	6.82	19.02	.0840
Dale County	90	1,226.5	194	5.25	.20	1.63	5.32	12.40	.0640
South Carolina:									
Anderson County	89	2,865.5	248	11.80	.28	1.57	5.84	19.49	.0786
Barnwell County	91	3,935.5	268	7.22	.15	1.67	6.24	15.28	.0571
Texas:									
Ellis County	75	8,148.0	176	16.83	.44	1.48	2.31	21.06	.1193
Rusk County	75	2,568.0	185	5.15	.28	1.72	3.87	11.02	.0594

The most important item in this group is the cost for the use of land. It will be seen that there is a range from $3.10 per acre in Tallapoosa County, Ala., to $16.83 per acre in Ellis County, Tex. Overhead expense is the second item of importance under "Other costs." Under this heading there was a variation in the average cost from $2.31 to $6.82 per acre. The unit cost for all of the items which have been mentioned varied from 5 cents per pound to approximately 12 cents

per pound. Table IX gives a summary of all costs, the seed credit per acre allowed within each group, and the total net cost per acre and per pound.

The cotton seed was considered as a by-product of the cotton enterprise. On farms where the seed was sold at the end of the harvest season a record was made of the income derived from this source. Where the seed was not sold a value was assigned corresponding to market value at the time the record was taken. These two estimates were used in making up the total seed credit per acre. It will be seen that there was a range in seed credit of from $9.78 per acre in Ellis County, Tex., to $15.81 in Greene County, Ga. In seven districts there was considerable uniformity in the average seed credit which was computed from the records taken. The average unit cost per district has been discussed in preceding tables.

TABLE IX.—*Summary of all costs (842 records).*

State and county.	No. of records.	Total number acres in cotton.	Yield of lint per acre.	All costs, including use of land.							Seed credit per acre.	Total net cost.	
				Labor.	Material.	Ginning.	Use of land.	Miscellaneous cost.	Total per acre.	Total per pound of lint.		Per acre.	Per pound of lint.
Georgia:			*Lbs.*										
Laurens Co.	85	3,968.0	277	$52.31	$5.40	$2.14	$7.38	$7.76	$74.99	$0.2705	$15.55	$59.44	$0.2144
Greene Co.	78	4,147.5	260	50.54	6.46	2.09	7.47	7.51	74.07	.2850	15.81	58.26	.2242
Sumter Co.	80	4,188.5	244	40.44	7.63	1.92	6.76	6.68	63.43	.2599	15.35	48.08	.1970
Alabama:													
Tallapoosa Co.	89	1,169.0	172	54.51	5.17	1.39	3.10	7.69	71.86	.4169	10.31	61.55	.3571
Marshall Co.	90	1,249.5	227	57.88	10.30	1.94	9.32	9.70	89.14	.3934	13.72	75.42	.3329
Dale Co.	90	1,226.5	194	47.38	5.88	1.62	5.25	7.15	67.28	.3472	13.17	54.11	.2792
South Carolina:													
Anderson Co.	89	2,865.5	248	50.21	8.21	1.97	11.80	7.69	79.88	.3223	14.80	65.08	.2626
Barnwell Co.	91	3,935.5	268	49.03	13.41	2.07	7.22	8.03	79.79	.2981	14.13	65.66	.2453
Texas:													
Ellis Co.	75	8,148.0	176	21.93	1.20	1.82	16.83	4.23	46.01	.2607	9.78	36.23	.2053
Rusk Co.	75	2,568.0	185	35.22	3.52	1.79	5.15	5.87	51.55	.2781	10.19	41.36	.2231

DISTRIBUTION OF COSTS.

The relative importance of some items of farm expense pertaining to the production of cotton has been brought to the attention of the reader in a general discussion of labor costs, material costs, and other costs. These three groups have been contrasted for the purpose of showing the importance of man and mule labor when combined, with all materials combined, and other costs combined. Table X contains an analysis of the percentage distribution of costs under four headings. Ginning has been set out separately in this analysis.

TABLE X.—*Distribution of costs (842 records).*

State and county.	Number of records.	Total number of acres in cotton.	Yield of lint per acre.	Percentage of total cost to—			
				Labor.	Material.	Ginning.	Other.
Georgia:			*Pounds.*				
Laurens County	85	3,968.0	277	70	7	3	20
Greene County	78	4,147.5	260	68	9	3	20
Sumter County	80	4,188.5	244	64	12	3	21
Alabama:							
Tallapoosa County	89	1,169.0	172	76	7	2	15
Marshall County	90	1,249.5	227	65	12	2	21
Dale County	90	1,226.5	194	71	9	2	18
South Carolina:							
Anderson County	89	2,865.5	248	63	10	3	24
Barnwell County	91	3,935.5	268	61	17	3	19
Texas:							
Ellis County	75	8,148.0	176	47	3	4	46
Rusk County	75	2,568.0	185	68	7	4	21

The labor column includes all man and mule labor. This group is by far the most important from the standpoint of cost in the production of cotton. The above table shows a range from 47 per cent in Ellis County, Tex., to 76 per cent in Tallapoosa County, Ala. In eight districts the labor costs approximated 61 to 71 per cent of the total cost of production.

The item second in significance was fertilizers. In view of the fact that cotton occupies such a prominent position on these farms, and taking into account the necessity for plant food on many of the soil types on farms which are reported in this survey, it would be quite natural to look for a fairly large outlay for fertilizers, especially under the prices that obtained during the season of 1918. The Ellis County farmers applied no fertilizer whatever. In the remaining areas the fertilizer expense varied from 7 to 33 per cent of the total farm expenses. Dale and Tallapoosa Counties, Ala., and Rusk County, Tex., had a relatively low proportion of the total farm expense devoted to the purchase of fertilizers.

TABLE XI.—*Distribution of costs—charge for "use of land" excluded (842 records).*

State and county.	Number of records.	Total number of acres in cotton.	Yield of lint per acre.	Percentage of total cost to—			
				Labor.	Material.	Ginning.	Other.
Georgia:			*Pounds.*				
Laurens County	85	3,968.0	277	77	8	3	12
Greene County	78	4,147.5	260	76	10	3	11
Sumter County	80	4,188.5	244	71	14	3	12
Alabama:							
Tallapoosa County	89	1,169.0	172	79	8	2	11
Marshall County	90	1,249.5	227	73	13	2	12
Dale County	90	1,226.5	194	76	9	3	12
South Carolina:							
Anderson County	89	2,865.5	248	74	12	3	11
Barnwell County	91	3,935.5	268	68	18	3	11
Texas:							
Ellis County	75	8,148.0	176	75	4	6	15
Rusk County	75	2,568.0	185	76	7	4	13

It is significant to note that the omission of land rent from Table XI changes the percentages in the labor column so that this item constitutes from 70 to 80 per cent of the total cost of producing cotton in practically all districts. A comparison of the two methods shows distinctly that where land rental is omitted in the Ellis County area the percentage of total cost for labor falls in line with the proportion indicated for other districts which were used in this study.

Ginning, bagging and ties combined come third in point of importance in the list of farm expenses. From 3 to 11 per cent of the total farm expenses came under this heading. There was considerable uniformity in the proportion paid out in the various districts under such headings as machinery repairs, depreciation of buildings, seed, insurance, and taxes.

RELATION OF ACREAGE AND YIELD TO NET COST PER POUND OF LINT.

Cotton is a crop which requires intensive culture. The area devoted to cotton on a given farm will be limited by the amount of labor available to do the chopping and picking. Even on the large plantations the operating plans must take these two items into consideration. The areas assigned to tenants and croppers should conform to the size that will enable the operator, tenant, and cropper to handle the cotton crop efficiently.

In order to throw more light upon the costs for the small units in comparison with the costs for the larger units, the farms in this study have been grouped according to the number of acres of cotton grown. They have also been classified with respect to the yields obtained. (See Table XII.) The latter arrangement affords an opportunity to study the effect of normal yields upon the cost of producing the cotton crop. It has been pointed out that the average yield of lint cotton for the 842 farms was 227 pounds per acre and that this was considerably above the average yield reported for the United States in 1918. It was also somewhat in advance of the average yield of lint cotton reported for the 10-year period in the United States.

TABLE XII.—*Relation of acreage and yield to net cost per pound of lint.*

Groups.	100 pounds and under.			100 to 150 pounds.			150 to 200 pounds.		
	Number of records.	Net cost per acre.	Net cost per pound.	Number of records.	Net cost per acre.	Net cost per pound.	Number of records.	Net cost per acre.	Net cost per pound.
20 acres and under	24	$49.90	$0.5716	54	$53.92	$0.4035	95	$57.41	$0.3245
20 to 40 acres	2	31.36	.3248	22	40.37	.3064	63	48.21	.2690
40 to 60 acres	1	22.04	.2204	9	35.11	.2528	24	46.17	.2658
60 to 80 acres	1	27.93	.2992	9	33.88	.2464	14	41.17	.2276
80 to 100 acres	.....	.....	.....	6	38.91	.2954	13	37.51	.2106
Over 100 acres	.....	.....	.....	6	35.72	.2550	17	35.74	.2011

Groups.	200 to 250 pounds.			250 to 300 pounds.			Over 300 pounds.		
	Number of records.	Net cost per acre.	Net cost per pound.	Number of records.	Net cost per acre.	Net cost per pound.	Number of records.	Net cost per acre.	Net cost per pound.
20 acres and under	83	$68.36	$0.2974	48	$64.73	$0.2356	53	$80.65	$0.2226
20 to 40 acres	75	54.28	.2312	46	66.00	.2385	38	76.93	.2130
40 to 60 acres	30	53.92	.2392	19	58.41	.2100	19	71.58	.2048
60 to 80 acres	13	50.77	.2226	3	51.56	.1867	5	64.89	.2016
80 to 100 acres	8	49.25	.2129	2	40.12	.1669	4	81.72	.1894
Over 100 acres	14	47.33	.2164	12	56.83	.2091	10	71.34	.2063

In general, it may be stated that as the yield of lint cotton increases on these farms the net cost per acre increases, while the net cost per pound decreases. Within the limit reached by these growers. increasing the yield is an important factor in reducing the unit cost, The point of diminishing returns has not been reached by any of the groups. The 24 farms having a yield of 100 pounds of lint per acre and under had a net cost per acre of $49.30 and a net cost per pound of 57 cents; whereas the 53 farms producing over 300 pounds of lint per acre had a net cost of $80.65 per acre and a net cost per pound of 22 cents.

Some of the groups (Table XII) contain only a few farms, hence the costs for these groups can not properly be compared with groups including a large number of farms. Where comparison can be made it would appear that the farms producing the larger acreages have the lower unit costs. This correlation is particularly noticeable in comparing the farms producing 20 acres of cotton and under with those which had 20 plus to 40 acres. With a few exceptions, this rule holds true for the farms producing the higher yields up to farms having more than one hundred acres of cotton. It should be pointed out that it does not necessarily follow, because unit cost goes down as size of farm increases, that the cost is altogether controlled by size of farm. The human factor comes into play here, and it may be that the reduction in cost on the larger farms is attributable in considerable measure to the superior ability of their operators.

NORMAL TIME REQUIRED FOR VARIOUS OPERATIONS.

The various operations involved in the production of cotton will be taken singly in succeeding pages. It might be well first to consider these operations as a whole. The interest of the grower is concerned chiefly with the more common crew sizes, with the number of acres that can be covered in a normal day's work, and with the seasonal distribution of the different classes of work. Table XIII presents a summary of these items.

It has been shown that the man and mule labor required in cotton production constitutes a very important part of the total cost of growing the crop. It would, therefore, appear to be exceedingly desirable to analyze these two factors for the purpose of presenting the normal time devoted to the different labor operations that were reported for the ten districts under consideration. There was quite a wide variation in the methods employed in the respective areas. There was also an appreciable range in the time required for these operations. The latter may be explained in part by variations in the crew size, the character of the implements used, and the number of times the area may have been worked. A brief review of the tables which contain an analysis of the man and mule labor requirements

will assist in bringing to the attention of the reader a few of the outstanding differences in cultural practices. This study will also provide some fundamental facts concerning the normal time required for both man and mule labor in the more common field operations of cotton production.

TABLE XIII.—*Acres covered per day in various operations and seasonal distribution of labor.*

Operation.	Most common crew.		Acres per day.	Time of operation.
	Man.	Mule.		
Cut stalks	1	2	5 to 9	January and February.
Haul fertilizer	1	2	9 to 15	December to February.
Distribute fertilizer	1	1	4 to 6	March and April.
Break	1	2	1 to 2	November to March.
Harrow	1	2	5 to 15	February to April.
Lay off rows	1	1	4 to 8	Do.
Open rows	1	1	5 to 6	Do.
Smooth	1	2	5 to 12	Do.
Bed and rebed	1	1	2 to 5	March and April.
Run middles	1	1	4 to 8	Do.
Plant	1	1	5 to 8	Apr. 1 to June 1.
Weed	1	1	4 to 8	April to June.
Bar off	1	1	2 to 4	May and June.
Chop	1	.....	¾ to 2	Do.
Side cotton	1	1	3 to 4	June and July.
Bust middles	1	1	5 to 7	June to August.
Hoe	1	.....	1 to 2	Do.
Plow or cultivate	1	1	3 to 6	Do.
Pick	1	.....	.2 to .4	Aug. 15 to Dec. 25.
Weigh and house	1	2	4 to 6	
Haul to gin	1	2	2 to 5	
Market lint	1	2	5 to 8	

In reporting the crew sizes for the various operations connected with the production of cotton, it will be observed that fractions occur in both the man and mule columns. These figures represent averages for all the farms performing the different classes of work. With many of these operations there was considerable variation in the crews that were employed. For instance, flat breaking was done with crews consisting of one man and one mule, one man and two mules, one man and three mules, one man and four mules, and in a few cases even larger crews were shown. By placing all farms within a given district together and by computing averages for the number of men and mules utilized in doing the flat breaking, fractions will of course occur, though in actual practice there is no such thing as a fractional unit. The dominance of certain crew sizes always exerts considerable influence upon the average which is obtained. It is of very great importance to know something about the distribution of the crew sizes for the different operations. That feature has been given special attention in the discussions which accompany each of the field practice tables.

CLEAN DITCHES AND TERRACES.

It is a common practice in the Cotton Belt, especially on land that was somewhat rolling, to terrace in order to prevent undue erosion. Except on new land, the terraces have existed for several years. After the terrace has been constructed there is more or less annual up-keep. Some terraced fields have open ditches through them. Attention must also be given to drainage and where open drains are used a certain amount of cleaning must be done during the spring and summer months. There were 580 records (70 per cent) which included cleaning terraces and ditches. (See Table XIV.)

TABLE XIV.—*Clean ditches and terraces.*

State and county.	Reporting.		Acres per farm.		Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.	Man.	Mule.	Man.	Mule.
Georgia:								
Laurens County	48	56	45.04	44.10	1.8	1.8	1.5	1.7
Greene County	71	91	54.99	54.43	2.1	.9	3.8	1.1
Sumter County	47	59	59.63	59.63	2.3	.7	2.0	.5
Alabama:								
Tallapoosa County	60	67	13.93	13.93	1.3	.8	4.6	2.8
Marshall County	88	98	14.06	14.06	1.1	1.7	2.8	3.9
Dale County	44	49	16.68	16.68	1.2	1.3	3.3	3.7
South Carolina:								
Anderson County	88	99	32.28	32.28	2.6	2.0	2.4	1.6
Barnwell County	17	19	66.59	66.59	2.3	.7	3.2	.7
Texas:								
Ellis County	71	95	111.66	111.52	1.8	1.9	1.0	.9
Rusk County	46	61	36.37	36.37	2.0	1.3	1.3	.7

On the farms of some districts the cleaning was done entirely by hand. Other farms in the same area use both man and mule labor. Crews of one man and one mule, one man and two mules were reported in nearly all districts. These crew sizes were about equally divided. Sometimes the cleaning was done with a V-drag, scraper, or turning plow. The hand work was done with a shovel, or hoe, and in some instances a scythe. For most districts the normal requirement varied from one to three man hours per acre. In a nine-hour day, one man would be able to do the cleaning on three to nine acres of land.

CUT STALKS.

In the districts visited cotton is frequently planted upon the same land continuously. It may also follow corn. The stalks of cotton or corn, especially if of any great size, are usually broken down with a stalk cutter before the operator is ready to proceed with the initial tillage in the preparation of the land for a new crop. There were some areas in which the stalks made a very limited growth and no cutting was necessary prior to the breaking or plowing. These records

represented approximately 20 per cent of the growers who were interviewed. Of the remaining 80 per cent, 60 per cent did the cutting with the stalk cutter, using mule or horse power. The remainder did the work by hand, using a stick or a hoe. The latter process is known as "knocking stalks." The most common crew employed in stalk cutting consisted of one man and two mules. Under the average requirements, 5 to 9 acres would constitute a day's work with the latter crew. (See figs. 3 and 4.)

FIG. 3.—Knocking stalks.

TABLE XV.—*Cut stalks.*

State and county.	Reporting.		Acres per farm.		Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.	Man.	Mule.	Man.	Mule.
Georgia:								
Laurens County	78	92	45.49	45.04	1	2.0	1.3	2.6
Greene County	11	14	85.00	84.00	1	2.0	1.3	2.6
Sumter County	42	53	59.48	58.10	1	2.0	1.2	2.4
Alabama:								
Tallapoosa County	22	25	15.55	15.55	1	1.7	2.2	3.2
Marshall County	77	86	13.99	13.99	1	2.0	1.2	2.4
Dale County	49	54	16.65	15.69	1	2.0	1.4	2.8
South Carolina:								
Anderson County	33	37	41.86	33.65	1	2.0	1.2	2.4
Barnwell County	59	65	46.53	46.02	1	2.0	1.1	2.2
Texas:								
Ellis County	60	80	106.68	84.62	1	2.4	1.0	2.2
Rusk County	62	83	35.74	33.31	1	2.0	1.2	2.4

HAUL AND SCATTER MANURE.

A casual glance at Table XLIII showing the distribution of receipts from various enterprises on these farms will indicate that live stock did

not contribute very substantially to the farm income, for only 27 per cent of the total operators who were interviewed applied some farm manure to cotton land. The application of manure ranged

FIG. 4.—Cutting stalks.

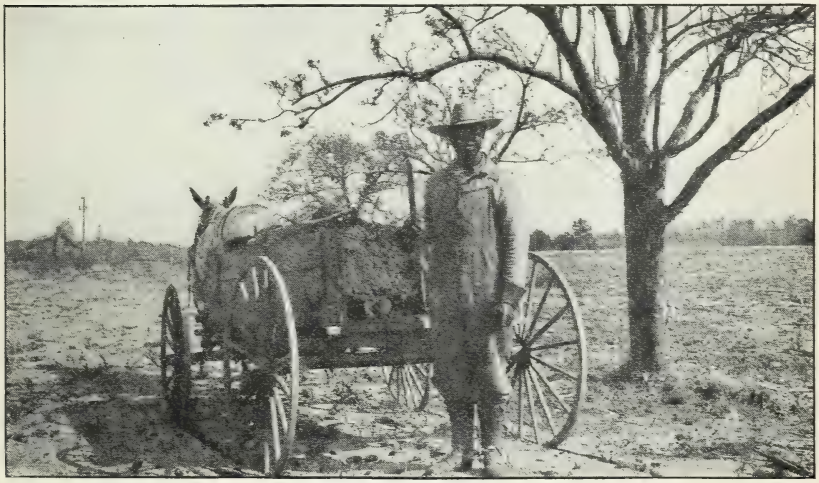

FIG. 5.—Hauling manure.

from 1 to 5 loads per acre, while the most common crew consisted of 2 men and 2 mules. Some hauling was done with a crew of one man and one mule. (See fig. 5.)

TABLE XVI.—*Haul and scatter manure.*

State and county.	Reporting.		Acres per farm.		Crew.		Loads per acre.	Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.	Man.	Mule.		Man.	Mule.
Georgia:									
Laurens County	6	7	38.17	12.33	1.8	2.5	3.48	6.1	9.5
Greene County	42	54	49.33	27.33	1.9	2.0	1.02	3.1	3.1
Sumter County	38	48	58.80	21.07	3.0	2.2	2.44	7.5	5.5
Alabama:									
Tallapossa County	11	12	6.95	6.59	1.3	2.0	3.08	6.9	11.3
Marshall County	59	66	14.38	11.36	1.5	1.8	1.02	3.3	3.7
Dale	13	14	19.73	9.19	2.5	2.0	2.36	10.6	8.2
South Carolina:									
Anderson County	28	31	41.59	34.20	3.0	2.0	.62	2.6	1.7
Barnwell County	27	30	60.41	40.22	3.9	1.8	1.04	5.0	2.5
Texas:									
Ellis County	2	3	200.50	4.75	.....	.....	2.43	12.0	17.2
Rusk County	2	3	32.50	5.00	1.5	2.0	5.12	14.5	24.5

COMMERCIAL FERTILIZERS.

Commercial fertilizers are used quite generally in the cotton-growing areas of the South, and in the ten districts embraced in this survey commercial fertilizer was purchased and applied quite liberally in all areas except on the farms of Ellis County, Tex.

TABLE XVII.—*Haul fertilizer.*

State and county.	Reporting.		Acres per farm.		Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.	Man.	Mule.	Man.	Mule.
Georgia:								
Laurens County	82	96	47.02	46.90	1.4	2.1	0.8	1.3
Greene County	76	97	52.49	49.99	1.3	2.1	.4	.7
Sumter County	79	99	52.77	52.70	1.3	2.2	.9	1.7
Alabama:								
Tallapoosa County	79	89	13.89	13.89	1.0	1.9	1.1	2.1
Marshall County	90	100	13.88	13.88	1.0	1.7	1.0	1.5
Dale County	88	98	13.74	13.67	1.0	1.8	.8	1.4
South Carolina:								
Anderson County	87	98	32.28	32.28	1.2	2.0	.6	1.0
Barnwell County	91	100	43.25	43.25	1.4	2.1	1.1	1.8
Texas:								
Rusk County	67	89	35.03	30.55	1.0	2.0	.8	1.6

Taking all farms where fertilizer was hauled into consideration there was a variation from 0.6 of a man hour up to 1.1 man hours per acre, with slightly higher normal requirements for mule labor. Under average conditions one would expect to use about an hour of man labor and two hours of mule labor for the purpose of hauling commercial fertilizer for each acre of cotton.

TABLE XVIII.—*Distribute fertilizer.*[1]

State and county.	Reporting.		Acres per farm.		Pounds per acre.	Crew.		Hours per acre.	
	Number.	Percent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	83	98	46.96	46.84	294	1.2	1.0	1.9	1.7
Greene County	77	99	53.69	53.69	260	1.1	1.0	2.0	1.9
Sumter County	80	100	52.36	52.29	286	1.1	1.0	1.9	1.8
Alabama:									
Tallapoosa County	81	91	13.62	13.59	205	1.0	1.0	2.0	2.0
Marshall County	90	100	13.88	13.88	333	1.0	1.0	1.8	1.8
Dale County	90	100	13.63	13.56	250	1.0	1.0	2.0	2.0
South Carolina:									
Anderson County	88	99	32.20	32.20	408	1.2	1.0	2.4	2.0
Barnwell County	91	100	43.25	43.25	555	1.2	1.1	2.3	1.9
Texas:									
Rusk County	68	91	34.88	30.47	159	1.0	1.1	1.5	1.6

[1] This table includes records where fertilizing was done by hand, except as regards normal time.

Mix fertilizer.—Some hand labor was used in mixing fertilizer on the farms prior to distribution in the field. Occasionally two or more grades may be purchased separately and before distributing to the cotton rows the two or more kinds may be mixed. Comparatively speaking, only a few growers did any hand mixing of fertilizer.

The application of fertilizer.—Ordinarily the distribution of fertilizer on cotton land follows some of the primary work of seed bed preparation. If the successive steps in getting land ready for cotton are to be treated in logical order, then breaking or plowing should precede a discussion of labor used in putting on fertilizer. However, in dealing with the requirements of the latter work it seemed desirable to bring together all of the items that relate directly to the utilization of commercial fertilizer. Eighty-nine per cent of the men interviewed gave estimates on fertilizer distribution. (See Table XVIII.)

On a majority of the farms the fertilizer was put on with a 1-row distributor operated by a crew of one man and one mule. There were a few cases in which the man running the distributor had some assistance for part time. About two hours per acre of man labor were spent in distributing fertilizer in a majority of the districts. This means that about 5 acres of cotton land would be treated with fertilizer in a 10-hour day. The period of application varied from March 20 to May 10. Two districts, i. e., Tallapoosa County, Ala., and Anderson County, S. C., included some farms where the fertilizer was put on by hand. The normal man labor requirement for 10 farms where fertilizer was put on by hand was 2.9 hours per acre. This work was done with a minimum of 2.2 hours per acre in a few districts. (See fig. 6.)

Side dress.—This term refers to fertilizer applied at the side of the row after the cotton plants had attained some size. The chief center

of this work appeared to be in Barnwell County, S. C. Some side dressing was done in Anderson County, S. C. Likewise a very small amount of this work occurred in Sumter County, Ga. Taking all records into consideration only 6 per cent of the men interviewed did any side dressing.

FIG. 6.—Distributing fertilizers by hand.

TABLE XIX.—*Cover fertilizer.*

State and county.	Reporting.		Acres per farm.		Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.	Man.	Mule.	Man.	Mule.
Georgia:								
Laurens County	32	38	58.09	56.28	1	1.0	1.6	1.6
Sumter County	7	9	63.71	63.71	1	1.0	2.5	2.5
Alabama:								
Tallapoosa County	6	7	12.00	12.00	1	1.0	1.8	1.8
Marshall County	25	28	14.90	14.90	1	1.0	1.6	1.6
Dale County	4	4	12.50	12.50	1	1.0	2.8	2.8
South Carolina:								
Anderson County	8	9	21.38	19.75	1	1.1	2.3	2.5
Barnwell County	46	51	53.37	53.37	1	1.0	2.8	2.8

Cover fertilizer.—Only 15 per cent of the total number of farmers interviewed did any covering following the application of the fertilizer. In cases where this plan obtained the rows were opened first with a stripper or middle-buster, then the fertilizer was applied either with a distributor or by hand and the covering was done with a

scratch harrow, a scooter plow, or a cultivator. A crew of one man and one mule was used almost exclusively in doing the covering. The normal time required for covering fertilizer appeared to be slightly greater than the normal time required for distributing fertilizer. However, it should be noted that only 128 men reported covering.

BREAK LAND.

There was a wide difference in the methods followed in plowing or breaking land. In several districts it was a common practice to break the land level. This method is known as "flat breaking" in some districts. However, in areas where this plan was the dominant

FIG. 7.—Breaking land with a one-horse turning plow.

one, other methods of doing the initial work were frequently mentioned. Obviously there was a wide difference in the crew sizes utilized and in the type of implement used in doing the breaking. Flat breaking was reported by 67 per cent of all operators. (See Table XX.)

The greater part of the breaking was done during the period from November to March. However, in a few cases this work was done outside of these limits. In six districts it required six hours or more of man labor to break an acre of land. One may infer that the men in these areas did the breaking at the rate of an acre and a half per day under average conditions. (See fig. 7.)

TABLE XX.—*Flat break land.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	85	100	46.68	46.51	1.0	1.0	1.8	6.1	10.5
Greene County	54	69	55.53	42.51	1.1	1.1	1.7	6.6	11.0
Sumter County	78	98	53.01	51.60	1.0	1.0	1.9	4.9	9.3
Alabama:									
Tallapoosa County	53	60	13.84	13.84	1.0	1.0	1.2	8.4	9.5
Marshall County	42	47	15.21	14.32	1.0	1.0	1.7	6.4	10.3
Dale County	51	57	17.06	16.67	1.0	1.0	1.7	6.4	9.8
South Carolina:									
Anderson County	24	27	29.87	27.50	1.0	1.0	1.8	5.6	10.1
Barnwell County	88	97	44.19	44.18	1.0	1.0	1.4	6.1	8.1
Texas:									
Ellis County	48	64	120.00	21.35	1.0	1.0	3.3	4.7	14.7
Rusk County	43	57	40.05	30.86	1.0	1.0	1.9	5.0	9.9

HARROW.

Twenty-four per cent of the farm operators reported harrowing. (See Table XXI.) The period for this work extended from February to April. In the western part of the cotton belt the crew sizes reported for harrowing were uniformly larger than in the eastern districts. It was not uncommon to find one man and four mules assigned to this work in the Texas areas visited. It will be seen that about 5 acres would be harrowed per day in several of these districts.

TABLE XXI.—*Harrow.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	34	40	48.74	37.10	1.2	1.0	2.2	1.7	3.7
Greene County	26	33	62.33	51.37	1.4	1.0	1.9	2.2	4.3
Sumter County	33	41	52.73	51.79	1.4	1.0	2.5	2.0	4.9
Alabama:									
Tallapoosa County	25	28	14.00	14.00	1.0	1.0	1.2	1.9	2.1
Marshall County	3	3	24.00	24.00	1.0	1.0	1.7	1.2	1.9
Dale County	3	3	21.67	13.67	1.0	1.0	1.7	1.3	1.9
South Carolina:									
Anderson County	13	15	30.54	28.23	1.5	1.0	1.5	1.7	2.6
Barnwell County	18	20	82.17	68.44	1.4	1.2	2.2	1.9	3.6
Texas:									
Ellis County	23	31	120.83	33.13	1.2	1.0	3.3	.7	2.4
Rusk County	26	35	44.92	34.46	1.1	1.0	2.2	1.1	2.6

LAY OFF ROWS.

After breaking the land and doing some harrowing, it is customary to lay off or mark out the rows with a small shovel plow. Rows are laid off as a guide for bedding or planting. The fertilizer is distributed in the bottom of this furrow. A bed is then made over the

fertilizer with a one-horse turning plow. Sixty-eight per cent of the cotton growers laid off rows. (See Table XXII.)

In several districts the rows were laid off almost exclusively with a crew consisting of one man and one mule. There were some farmers of these districts who used a crew of one man and two mules. In several of these districts a day's work approximated 5 acres. (See fig. 8.)

FIG. 8.—Laying off rows with two mules.

TABLE XXII.—*Lay off rows.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	72	85	48.26	47.81	1.0	1	1.2	1.8	2.1
Greene County	47	60	49.52	47.24	1.0	1	1.6	2.1	3.3
Sumter County	75	94	53.26	52.33	1.0	1	1.4	1.5	2.1
Alabama:									
Tallapoosa County	57	64	14.39	14.39	1.0	1	1.0	2.1	2.1
Marshall County	79	88	14.03	14.03	1.0	1	1.2	1.5	1.9
Dale County	54	60	15.97	15.60	1.0	1	1.2	1.9	2.2
South Carolina:									
Anderson County	34	38	28.03	26.85	1.1	1	1.5	2.0	2.8
Barnwell County	90	99	43.55	43.55	1.0	1	1.0	1.4	1.4
Texas:									
Ellis County	36	48	129.06	25.17	1.0	1	2.1	.8	1.7
Rusk County	25	33	43.28	33.96	1.0	1	1.2	1.4	1.8

OPEN ROWS.

A few of the growers (13 per cent) followed the practice of opening rows prior to putting on the fertilizer. (See Table XXIII.)

The rows were opened in different ways, some using a stripper or middle-buster, others using a heel sweep, bull tongue, scooter, or some such implement, attached to a Georgia stock. The crew consisted chiefly of one man and one mule. This practice was common

to Tallapoosa and Dale Counties, Ala., and Rusk County, Tex. In a majority of the districts reporting this work the normal man labor requirement was approximately two hours per acre, which would mean that the average grower could count upon opening rows on 5 acres per day. (See fig. 9.)

FIG. 9.—Using a lister to open rows.

TABLE XXIII.—*Open rows.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	5	6	48.80	48.80	1	1	1.0	1.5	1.5
Sumter County	7	9	63.43	63.43	1	1	1.3	1.8	2.3
Alabama:									
Tallapoosa County	34	38	14.10	14.10	1	1	1.0	2.0	2.0
Marshall County	3	3	11.50	11.50	1	1	1.0	1.7	1.7
Dale County	15	17	14.80	13.47	1	1	1.0	1.7	1.7
South Carolina:									
Anderson County	7	8	28.29	26.43	1	1	1.1	1.8	2.0
Barnwell County	9	10	90.22	90.22	1	1	1.0	1.4	1.4
Texas:									
Rusk County	33	44	29.18	28.88	1	1	1.1	1.5	1.6

DRAG OR SMOOTH.

Frequently it is the practice to level off the land with a log drag or float. This may appear to be a repetition of some work included under harrowing. In some districts at least there appeared to be a distinct difference in the two classes of work. Sixteen per cent of the records contained estimates on smoothing the land. (See Table XXIV.)

TABLE XXIV.—*Drag or smooth.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	6	7	56.83	33.50	1.2	1	1.8	1.7	3.0
Greene County	34	44	66.97	58.91	1.2	1	1.8	1.9	3.2
Sumter County	6	8	116.00	116.00	1.0	1	2.0	1.4	2.8
Alabama:									
Tallapoosa County	6	7	14.08	14.08	1.0	1	1.0	1.8	1.8
Marshall County	5	6	11.50	11.50	1.0	1	1.8	1.7	2.8
Dale County	1	1	13.00	13.00	1.0	1	2.0	1.7	3.4
South Carolina:									
Anderson County	60	67	35.69	33.64	1.1	1	1.7	1.3	2.0
Barnwell County	9	10	71.67	45.83	1.0	1	1.8	1.2	2.2
Texas:									
Ellis County	3	4	100.00	35.00	1.0	1	2.7	.5	1.3
Rusk County	1	1	64.00	64.00	2.0	1	3.0	1.8	5.4

BED AND REBED.

Bedding may be defined as the practice of throwing two or more furrows together for the purpose of forming a ridged surface. In many of the cotton-growing districts of the South it is customary to break the land, and harrow or smooth, open rows, and after distributing the fertilizer the soil is thrown into beds. In cases where the land is not broken, bedding may be the first operation after stalk cutting. Some cultivation may be given between the beds and after the fertilizer is distributed the land is rebedded, leaving a ridge upon which the cotton seed will be planted. Seventy-eight per cent of the farms surveyed reported rebedding. In the column "Times over," in Table XXV, the areas in which rebedding occurred are indicated by the figures showing bedding in excess if one time over.

TABLE XXV.—*Bed and rebed.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	24	28	48.88	46.90	1.0	1	1.1	2.6	2.7
Greene County	54	69	46.46	39.70	1.6	1	1.2	6.2	7.0
Sumter County	72	90	53.20	51.94	1.3	1	1.1	4.3	4.5
Alabama:									
Tallapoosa County	62	70	12.15	12.15	1.2	1	1.0	5.7	5.7
Marshall County	84	93	14.00	14.00	1.2	1	1.1	6.0	6.4
Dale County	78	87	13.02	12.16	1.1	1	1.0	6.6	6.6
South Carolina:									
Anderson County	78	88	32.12	31.92	1.5	1	1.3	6.6	8.1
Barnwell County	52	57	45.89	41.97	1.1	1	1.0	3.1	3.1
Texas:									
Ellis County	75	100	108.64	108.04	1.1	1	3.9	1.7	6.7
Rusk County—									
Bed	75	100	34.24	33.39	1.0	1	1.7	2.4	3.6
Rebed	59	79	32.47	26.81	1.0	1	1.5	2.7	3.6

On many of the farms where no breaking was done bedding and rebedding occurred. This work is usually done with a one-mule turning plow. The crew generally consisted of one man and one mule. Exceptions to this were found in Greene County, Ga.; Anderson County, S. C.; and Rusk County, Tex., where the crew included one man and two mules. In Ellis County, Tex., 90 per cent of the farm operators utilized a crew of one man and four mules for bedding. The bedding was done in Ellis County chiefly with a four-mule middle buster. The normal time for bedding in Ellis County was about two man hours per acre. It required approximately 6 man hours per acre to do this work in several districts.

RUN MIDDLES.

In bedding land for cotton a narrow strip of soil is left in the furrow between the two beds. When this is worked down with some tillage implement the operation is known as "running middles." Some of this work was undoubtedly given under other headings. Consequently a relatively small amount of time is reported in this connection. There were four districts in which this operation appeared to receive considerable attention. (See Table XXVI.)

TABLE XXVI.—*Run middles (seed-bed preparation).*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Greene County	4	5	34.50	33.00	1.0	1	1.5	1.7	2.5
Sumter County	44	55	53.76	53.76	1.0	1	1.0	2.1	2.1
Alabama:									
Tallapoosa County	35	39	12.11	12.11	1.0	1	1.0	2.9	2.9
Marshall County	24	27	14.71	14.71	1.0	1	1.0	1.8	2.0
Dale County	6	7	11.08	11.08	1.0	1	1.0	1.8	1.8
South Carolina:									
Barnwell County	9	10	47.61	37.17	1.0	1	1.0	1.4	1.4
Texas:									
Rusk County	23	31	46.00	41.70	1.2	1	1.2	1.6	1.9

This operation was not reported by cotton growers in Laurens County, Georgia, Anderson County, South Carolina, and Ellis County, Texas.

PLANT.

Planting was done in Alabama, Georgia, and South Carolina from March 15 to May 15. In the two Texas districts planting dates varied from March 15 to April 1 to June 8 and 10. In practically all of these areas cotton was planted on beds. This survey indicates a very extensive use of the one-row planter for putting in the cotton

seed. In all areas except one, more than 95 per cent of the operators planted with a one-row implement. In Rusk County, Tex., there were nine growers who planted with a crew of one man and two mules. Ellis County, Tex., had three men who planted with a crew of one man and three mules. (See Table XXVII.)

TABLE XXVII.—*Plant.*

State and county.	Number reporting.	Acres per farm.		Bushels per acre.	Times over.	Crew.		Hours per acre.	
		In cotton.	Covered.			Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	85	46.68	46.68	0.82	1.1	1.0	1.0	1.7	1.7
Greene County	78	53.17	53.17	1.18	1.1	1.1	1.0	2.2	2.1
Sumter	80	52.36	52.36	1.27	1.1	1.0	1.0	1.9	1.9
Alabama:									
Tallapoosa County	89	13.13	13.13	1.10	1.03	1.0	1.0	2.1	2.1
Marshall County	90	13.88	13.88	.93	1.04	1.0	1.0	1.8	1.8
Dale County	90	13.63	13.63	.88	1.1	1.0	1.0	2.2	2.2
South Carolina:									
Anderson County	89	32.20	32.20	1.15	1.1	1.0	1.0	2.0	2.0
Barnwell County	91	43.25	43.25	1.02	1.1	1.0	1.0	1.6	1.6
Texas:									
Ellis County	75	108.64	108.64	.70	1.03	1.0	2.0	1.4	2.8
Rusk County	75	34.24	34.24	.79	1.1	1.0	1.1	1.6	1.8

FIG. 10.—Planting cotton, Ellis County, Texas (one man and two mules).

The column headed "Times over" indicates that some replanting was done in all areas. The amount in each area was, however, insignificant. About 2 hours of man labor were required in most districts to plant an acre of cotton. For the average farm this would mean that planting would be done at the rate of 5 acres per 10-hour day. (See fig. 10.)

HARROW, OR WEED.

This work occurred between the planting period and the time when the cotton was large enough to chop. The implement used consists of a small one-horse A harrow, and sometimes a spike-tooth harrow. Weeding was done on 41 per cent of all farms. (See Table XXVIII.)

TABLE XXVIII.—*Harrow, or weed.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	72	85	46.81	45.90	1.1	1	1.0	1.7	1.7
Greene County	28	36	68.89	66.25	1.1	1	1.2	1.8	2.0
Sumter County	14	18	87.71	81.64	1.1	1	1.4	1.5	2.0
Alabama:									
Tallapoosa County	36	40	12.07	12.07	1.0	1	1.0	2.2	2.2
Marshall County	72	80	13.84	13.84	1.2	1	1.0	1.8	1.8
Dale County	12	13	25.92	24.50	1.0	1	1.0	2.0	2.0
South Carolina:									
Anderson County	71	80	33.89	32.79	1.2	1	1.1	2.0	2.1
Texas:									
Ellis County	21	28	130.71	79.43	1.2	1	2.0	.6	1.2
Rusk County	20	27	34.35	31.10	1.0	1	1.4	1.3	1.7

In nearly all districts the bulk of the harrowing and weeding was done with a crew of one man and one mule.

BAR OFF.

This operation, which precedes chopping cotton, is usually done with a small turning plow. This implement is run on either side of the cotton row, throwing the loose earth to the center and leaving the young cotton plants standing upon a narrow ridge. By doing this the plants are placed in a position which facilitates the work of "chopping out." There were two districts in which no barring off was reported. Barring off occurred on 59 per cent of all farms. (See Table XXIX.)

TABLE XXIX.—*Bar off.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	60	71	41.42	41.27	1.0	1	1.1	2.9	3.0
Greene County	67	86	54.15	54.15	1.0	1	1.0	3.4	3.4
Sumter County	77	96	52.51	51.86	1.0	1	1.0	3.2	3.2
Alabama:									
Tallapoosa County	68	76	12.93	12.93	1.0	1	1.0	3.7	3.7
Marshall County	80	89	14.18	14.18	1.0	1	1.0	3.1	3.1
Dale County	90	100	13.63	13.63	1.0	1	1.0	3.4	3.4
South Carolina:									
Anderson County	18	20	32.42	27.69	1.0	1	1.0	3.9	3.9
Texas:									
Rusk County	39	52	35.97	34.03	1.1	1	1.2	2.9	3.2

The barring off was done on the majority of farms with a crew of one man and one mule. In two districts there were a few growers who used a crew of one man and two mules. The normal amount of man labor required in performing the operation was approximately three hours per acre for a majority of the districts.

CHOP COTTON.

Sufficient cotton seed is planted to give a thick stand of plants, thereby necessitating considerable thinning when the young cotton has attained the proper growth. It is the custom to chop out these extra plants with a hoe, leaving the desired stand. This operation involves hand labor exclusively. Chopping out was done in part by the operator and his family, some by wage labor, and some on a contract basis. (See Table XXX.)

FIG. 11.—Chopping cotton.

Chopping begins some time in April for the early areas and it may extend well into June in the districts where the planting is done comparatively late. (See fig. 11.)

TABLE XXX.—*Chop cotton.*

State and county.	Reporting.		Acres per farm.			Crew (man).	Times over.	Man hours per acre.
	Number.	Per cent of total records.	In cotton.	Chopped by wage labor.	Chopped by contract.			
Georgia:								
Laurens County	80	94	47.95	41.59	6.36	1	1.0	9.2
Greene County	78	100	53.17	30.30	22.87	1	1.0	12.6
Sumter County	80	100	52.36	35.25	17.11	1	1.0	11.9
Alabama:								
Tallapoosa County	89	100	13.13	11.58	1.55	1	1.0	13.9
Marshall County	90	100	13.88	12.37	1.51	1	1.1	10.9
Dale County	90	100	13.63	10.34	3.29	1	1.0	11.6
South Carolina:								
Anderson County	89	100	32.20	27.38	4.82	1	1.0	12.6
Barnwell County	91	100	43.25	25.98	17.27	1	1.1	10.9
Texas:								
Ellis County	75	100	108.64	108.64	.....	1	1.0	7.5
Rusk County	75	100	34.24	33.85	.....	1	1.0	9.9

SIDE (DIRT BACK, RUN AROUND, ETC.).

Siding may be done with an ordinary sweep or with a side harrow or with a small shovel plow. Prior to chopping, the cotton is barred off or the soil is worked away from the plants. Immediately following the chopping the cultivation known as "siding" is given. This operation usually throws the dirt back to the plant. If the work is done with a scooter, the soil is simply stirred up and weeds are destroyed along the ridge left by the barring. This work was done on 86 per cent of the farms visited. (See Table XXXI.)

For all areas, with the exception of Rusk County, Tex., where about one-half of the growers reporting used a crew of one man and two mules, the common crew consisted of one man and one mule. In a few districts it required a day and a half of a man's time, or slightly more, to do the siding on an acre of land. There were other districts where this work was ordinarily done at the rate of 1 acre per day.

TABLE XXXI.—*Side (dirt back, run around, etc.).*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	70	82	43.99	43.77	4.5	1	1.0	12.9	12.9
Greene County	78	100	53.17	52.96	4.1	1	1.0	14.3	14.3
Sumter County	80	100	52.36	52.36	5.1	1	1.0	16.5	16.5
Alabama:									
Tallapoosa County	88	89	13.24	13.24	2.6	1	1.0	9.6	9.6
Marshall County	90	100	13.88	13.88	3.3	1	1.0	10.9	10.9
Dale County	90	100	13.63	13.63	2.9	1	1.0	10.4	10.4
South Carolina:									
Anderson County	87	98	31.83	31.83	4.7	1	1.0	16.4	16.4
Barnwell County	91	100	43.25	43.25	6.4	1	1.0	17.8	17.8
Texas:									
Rusk County	49	65	34.80	33.24	3.7	1	1.1	11.0	11.2

RUN OUT OR SWEEP MIDDLES.

This operation is usually done with a sweep. The object of the work is to tear down the ridges between the rows. The middles were cultivated with the sweep from one to four times. Eighty-five per cent of the farmers visited gave estimates concerning this operation. (See Table XXXII.)

TABLE XXXII.—*Run out or sweep middles.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	66	78	44.21	44.21	2.1	1	1.0	3.2	3.2
Greene County	74	95	53.80	53.80	2.3	1	1.0	4.1	4.1
Sumter County	80	100	52.36	52.36	3.5	1	1.0	5.9	5.9
Alabama:									
Tallapoosa County	77	87	14.23	14.23	1.6	1	1.0	3.2	3.2
Marshall County	89	99	13.75	13.75	2.3	1	1.0	3.8	3.8
Dale County	85	94	13.96	13.96	2.0	1	1.0	3.8	3.8
South Carolina:									
Anderson County	89	100	32.20	32.20	2.0	1	1.0	3.7	3.7
Barnwell County	87	96	44.42	44.42	2.5	1	1.0	3.3	3.3
Texas:									
Ellis County	4	5	103.75	25.50	1.0	1	1.8	1.6	2.9
Rusk County	67	89	33.61	32.63	2.4	1	1.1	3.9	4.1

HOE.

This consists chiefly of cutting out weeds which are not destroyed by cultivation, plowing, or chopping out. (See Table XXXIII.)

There was considerable difference in the number of times the cotton was hoed. The hoeing was done at the rate of from one-half acre to slightly more than 1 acre per day, under average conditions.

TABLE XXXIII.—*Hoe.*

State and county.	Reporting.		Acres per farm.			Crew (man).	Times over.	Man hours per acre.
	Number.	Per cent of total records.	In cotton.	Hoed by wage labor.	Hoed by contract.			
Georgia:								
Laurens County	75	88	48.89	47.88	1.01	1	1.6	11.2
Greene County	78	100	53.17	47.25	5.92	1	1.5	15.2
Sumter County	79	99	52.83	46.86	5.97	1	1.9	17.9
Alabama:								
Tallapoosa County	86	97	13.11	12.68	.43	1	1.5	16.6
Marshall County	90	100	13.88	13.73	.15	1	2.2	19.5
Dale County	89	99	13.61	13.07	.54	1	1.4	12.9
South Carolina:								
Anderson County	87	98	32.45	31.48	.97	1	1.9	15.5
Barnwell County	91	100	43.25	32.83	10.42	1	2.6	17.5
Texas:								
Ellis County	75	100	108.64	108.11	.....	1	2.0	8.5
Rusk County	71	95	34.94	34.54	.....	1	1.1	6.6

CULTIVATE.

The term "plowing" cotton is in much more general use in the South than cultivating. Such operations as barring off, siding and sweeping middles are all essentially intertillage processes. The fact that only 25 per cent of the total number of operators who were interviewed gave estimates on cultivation does not mean that on the remaining farms the cotton received no spring or summer cultivation. It does imply, however, that some other operation similar to barring off, busting middles, etc., was substituted for cultivation. (See Table XXXIV.)

TABLE XXXIV.—*Cultivate.*

State and county.	Reporting.		Acres per farm.		Times over.	Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.		Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	30	35	48.97	48.97	4.4	1	1.0	12.9	12.9
Greene County	5	6	58.30	54.30	1.2	1	1.2	2.1	2.6
Sumter County	1	1	65.00	65.00	2.0	1	2.0	3.7	7.4
Alabama:									
Tallapoosa County	51	57	12.93	12.93	3.8	1	1.0	14.6	14.6
Marshall County	32	36	13.41	13.41	4.2	1	1.0	13.4	13.4
Dale County	37	41	12.23	12.23	3.5	1	1.0	12.6	12.6
South Carolina:									
Anderson County	16	18	26.31	25.06	1.6	1	1.0	3.3	3.3
Texas:									
Ellis County	75	100	108.64	108.64	5.5	1	2.0	7.8	15.6
Rusk County	46	61	33.78	30.24	4.0	1	2.9	6.9	13.0

It will be seen that in Greene and Sumter Counties, Ga., and in Barnwell County, S. C., practically no cultivation was reported as such. A reference to preceding tables will indicate that the growers in these areas employed other methods. The crews in Georgia, Alabama, and South Carolina were largely 1-man and 1-mule, with a few 1-man, 2-mule crews. In Ellis County, Tex., the cultivation was all done with crews of the latter size. (See fig. 12.)

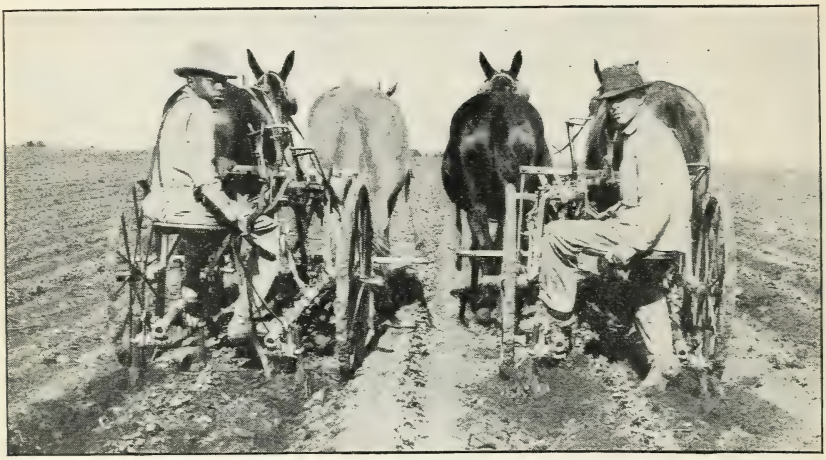

FIG. 12.—Type of cultivator used in western part of Cotton Belt.

PICK UP SQUARES IN THE BOLL WEEVIL DISTRICTS.

Some growers spent a limited a mount of time in picking up squares which had fallen from the cotton plants. This work was done by hand and it occurred chiefly in Laurens and Sumter Counties, Ga., and Tallapoosa and Dale Counties, Ala. Altogether 132 farmers did some of this work. The time requirement varied from 3 hours to 14.9 hours per acre. Practically the entire acreage of cotton on the farms reporting was gone over and the material which was gathered was burned.

PICK COTTON.

During the year 1918 the first picking of cotton was made from August 15 to September 1. In several areas harvesting continued intermittently up to the middle of December. Some picking was done as late as December 25 in one district. Four classes of labor were represented in doing the picking: First, the operator and his family; second, the wage laborer; third, the cropper labor; and, fourth, labor working on a contract basis. The first two classes are included under the heading "Picked by wage labor" in Table XXXV.

The normal quantity of seed cotton picked per day would not be far from 150 pounds for most districts. The yield of seed cotton per acre has a very important bearing on the amount of labor required in

doing the picking. The weather conditions throughout the harvest period are also significant because of the influence on the rapidity of ripening and subsequently on the length of the picking period.

TABLE XXXV.—*Pick cotton.*

State and county.	Number.	Acres per farm.			Per cent of total yield picked by wage.	Pounds per day.	Yield per acre.[1]	Man hours per acre.
		In cotton.	Picked by wage labor.	Picked by contract.				
Georgia:								
Laurens County	85	46.68	29.39	17.29	61	152	781	57.0
Greene County	78	53.17	37.95	15.22	65	151	743	45.0
Sumter County	80	52.36	36.12	16.24	64	157	725	46.9
Alabama:								
Tallapoosa County	89	13.13	11.12	2.01	86	155	484	33.8
Marshall County	90	13.88	12.75	1.13	91	155	632	46.6
Dale County	90	13.63	10.38	3.25	69	143	574	44.1
South Carolina:								
Anderson County	89	32.20	27.50	4.70	82	159	696	46.8
Barnwell County	91	43.25	24.95	18.30	55	142	723	49.2
Texas:								
Ellis County	75	108.64	12.71	95.93	11	236	510	23.8
Rusk County	75	34.24	22.15	[a]12.02	65	183	533	31.8

[1] Weighted average. [a] Five acres washed out.

TABLE XXXVI.—*Weigh (man and horse labor).*[1]

State and county.	Reporting.		Acres per farm.		Crew.		Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Covered.	Man.	Mule.	Man.	Mule.
Georgia:								
Laurens County	54	64	50.80	50.80	1.3	1.9	2.3	3.8
Greene County	54	69	60.80	52.18	1.1	1.9	2.8	5.0
Sumter County	36	45	59.51	57.42	1.4	1.9	2.0	3.4
Alabama:								
Tallapoosa County	17	19	17.24	17.24	1.3	2.0	1.8	3.0
Marshall County	1	1	15.00	15.00	1.0	2.0	1.3	2.6
Dale County	11	12	22.73	22.73	1.0	2.0	1.9	3.8
South Carolina:								
Anderson County	41	46	31.07	28.14	1.6	1.9	2.4	3.1
Barnwell County	39	43	54.73	47.68	1.5	2.0	2.1	3.0

WEIGH.

Several crew sizes were used in weighing up the seed cotton. The most common crew consisted of one man and two mules. (See Table XXXVI.) Weighing, in this connection, includes the mule labor of hauling cotton to cribs in the field or to the farm buildings at night. The normal man time for all groups varied from 1.3 to 2.8 hours per acre, while the normal mule labor requirement ranged from 2.6 to 3.8 hours per acre. Approximately 14 per cent of the farmers who were interviewed used man labor only in weighing up cotton. The normal requirement on these farms varied from 1.1 hours per acre to 3 hours per acre. In Ellis County, Tex., it was a common practice to pay a contract price of a dollar per bale for weighing in the field.

TABLE XXXVII.—*Weigh (man labor).*

State and county.	Reporting.		Acres per farm.		Crew (man).	Man hours per acre.
	Number.	Per cent of total records.	In cotton.	Covered.		
Georgia:						
Laurens County	20	24	46.65	46.65	1.1	1.9
Greene County	6	8	25.00	25.00	1.0	3.0
Sumter County	22	28	51.91	49.95	1.0	1.1
Alabama:						
Tallapoosa County	14	16	15.82	15.82	1.3	1.7
Dale County	7	8	16.71	16.71	1.7	1.2
South Carolina:						
Anderson County	14	16	25.71	25.71	2.1	1.6
Barnwell County	11	12	42.82	42.82	2.3	1.3
Texas:						
Ellis County	16	21	134.25	127.69	1.0	2.0
Rusk County	9	12	44.78	30.24	1.0	3.3

HAUL TO GIN.

The comparatively low hauling distance in Ellis County, Tex., (Table XXXVIII) is due to the fact that there are many small gins located at different points in the district. The normal man labor requirement for hauling to the gin ranged from 1.8 hours per acre in Rusk County, Tex., to 7.2 hours per acre in Barnwell County, S. C.

TABLE XXXVIII.—*Haul to gin.*

State and county.	Reporting.		Acres per farm.		Crew.		Miles.	Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Reporting.	Man.	Mule.		Man.	Mule.
Georgia:									
Laurens County	[a] 83	98	47.23	47.23	1.0	1.9	4.07	5.3	10.6
Greene County	78	100	53.17	53.17	1.1	2.2	3.25	4.6	8.9
Sumter County	80	100	52.36	52.36	1.0	2.0	5.31	4.0	8.0
Alabama:									
Tallapoosa County	89	100	13.13	13.13	1.0	2.0	5.06	3.4	6.5
Marshall County	[b] 89	99	13.94	13.94	1.0	2.0	2.68	3.9	7.8
Dale County	90	100	13.63	13.63	1.0	2.0	3.78	3.2	6.4
South Carolina:									
Anderson County	[b] 88	99	32.36	32.36	1.0	2.0	2.46	5.0	10.0
Barnwell County	[b] 90	99	43.56	43.56	1.0	1.9	3.65	7.2	13.3
Texas:									
Ellis County	75	100	108.64	108.64	1.0	2.0	3.65	1.8	3.6
Rusk County	75	100	34.24	[c] 34.17	1.0	2.0	1.97	2.5	5.0

[a] One with truck and one by contract.
[b] One by contract.
[c] Five acres not picked—washed out.

MARKET LINT.

At the time these records were obtained a portion of the lint was still in the hands of the grower. Some lint was sold at the gin immediately after picking. A portion of the crop was placed in cotton warehouses. This explains in part the fact that only 51 per cent of the total number of growers gave estimates concerning the marketing of lint. (See Table XXXIX.)

In the marketing of lint the majority of farmers used a crew of one man and two mules. However, on a few farms the hauling was done with a crew of one man and one mule. The column showing the per cent of the total records represents the proportion of growers who either hauled the lint back to the farm and in turn to the warehouse or who hauled from the country gin to the warehouse. All other labor for marketing lint is accounted for under the heading "Seed cotton to gin." The normal time requirement varied from 0.8 of an hour to 2.3 hours per acre. A corresponding range was shown for the mule labor.

TABLE XXXIX.—*Market lint.*

State and county.	Reporting.		Acres per farm.		Crew.		Miles hauled.	Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Reporting.	Man.	Mule.		Man.	Mule.
Georgia:									
Laurens County	63	74	51.33	41.18	1.1	2.1	6.52	1.5	2.9
Greene County	a 49	63	53.60	31.78	1.2	2.0	4.43	.8	1.3
Sumter County	34	42	55.47	44.31	1.0	2.0	7.27	1.3	2.6
Alabama:									
Tallapoosa County	32	36	14.59	12.81	1.0	1.9	11.87	2.3	4.3
Marshall County	31	34	12.73	12.13	1.0	1.7	5.61	1.8	2.9
Dale County	13	14	20.92	14.22	1.0	2.0	7.05	2.0	4.0
South Carolina:									
Anderson County	72	81	32.81	23.95	1.0	1.9	3.11	.8	1.4
Barnwell County	79	87	44.88	30.38	1.0	1.9	4.45	1.2	2.1
Texas:									
Rusk County	53	71	31.70	30.75	1.0	2.0	7.38	1.4	2.8

a One with truck.

MARKET SEED.

This operation was reported by 35 per cent of the farmers visited. (See Table XL.) Seed sold at the gin when the seed cotton was delivered does not come under this head. The labor involved in handling seed this way has been cared for under the heading "Hauling seed cotton."

TABLE XL.—*Market seed.*

State and county.	Reporting.		Acres per farm.		Crew.		Miles hauled.	Hours per acre.	
	Number.	Per cent of total records.	In cotton.	Reporting.	Man.	Mule.		Man.	Mule.
Georgia:									
Laurens County	59	69	47.41	35.61	1.2	2.1	7.11	2.0	3.7
Greene County	31	40	62.27	28.38	1.0	1.9	3.91	1.3	2.4
Sumter County	20	25	58.85	47.23	1.0	2.0	6.87	1.8	3.6
Alabama:									
Tallapoosa County	17	19	16.82	13.77	1.0	1.9	12.06	2.2	4.1
Marshall County	2	2	12.50	5.00	1.0	1.5	5.00	1.4	1.7
Dale County	6	7	13.17	12.17	1.0	2.0	9.83	3.1	6.2
South Carolina:									
Anderson County	57	64	33.11	19.23	1.0	2.0	3.24	1.3	2.6
Barnwell County	65	71	47.91	25.91	1.0	1.9	4.42	1.7	3.0
Texas:									
Rusk County	35	47	32.63	26.26	1.0	2.0	7.87	1.9	3.8

The hauling was done largely with a crew of one man and two mules. A crew consisting of one man and one mule was used on a few farms. It will be observed that there was a wide variation in the average distance of hauling. Hauling distance is a factor which influences the amount of time required in doing the marketing and this in turn has a direct relation to the cost of placing the cotton upon the market.

TOTAL MAN AND MULE LABOR REQUIREMENTS.

The man and mule labor required in growing and delivering to gin or market the cotton covered in this survey has been computed by districts on the basis of a weighted average. (See Table XLI.)

TABLE XLI.—*Man and mule labor requirements (per acre).*

State and county.	Number of records.	Acres in cotton.		Total hours per acre if marketed at gin.		Total hours per acre if hauled to market.[1]		Total hours per acre, hauling to market and supervision included.	
		Total.	Per farm.	Man.	Mule.	Man.	Mule.	Man.	Mule.
Georgia:									
Laurens County	85	3,968.0	46.68	123	56	127	63	142	63
Greene County	78	4,147.5	53.17	130	59	132	63	150	63
Sumter County	80	4,188.5	52.36	135	62	138	68	142	68
Alabama:									
Tallapoosa County	89	1,169.0	13.13	123	57	127	65	138	65
Marshall County	90	1,249.5	13.88	127	58	130	63	131	63
Dale County	90	1,226.5	13.63	117	53	122	62	127	62
South Carolina:									
Anderson County	89	2,865.5	32.20	130	55	132	59	145	59
Barnwell County	91	3,935.5	43.25	134	61	137	66	154	66
Texas:									
Ellis County	75	8,148.0	108.64	56	37	[2]	[2]	63	37
Rusk County	75	2,568.0	34.24	84	46	87	52	99	52

[1] Direct labor only, no supervision included.

[2] All sold at gin.

A very considerable part of the cotton crop in 1918 was not sold immediately after harvesting and ginning, but was held in warehouses or on the farms. When held on the farm there is labor to account for in returning the lint from the gin, and this amount is increased still further when these bales are sold and marketed. In tabulating these data, the total hours per acre if marketed at the gin were determined. A second calculation was made, which shows the total hours of man and horse labor when lint is hauled to market. The final columns of Table XLI include an allowance for hauling to market and supervision in these districts.

Reasons may be found in the discussion of various practices and the occurrence of these cultural methods in the 10 districts under consideration for the wide difference in total hours of man and mule labor utilized in producing cotton in these districts. The average man labor requirement ranged from 63 hours per acre in Ellis County,

Tex., to 154 hours per acre in Barnwell County, S. C. In six districts having fairly uniform methods of culture there was a variation of from 131 hours per acre to 145 hours for man labor.

The more extensive cultural methods employed in Texas, in comparison with those used in the southeastern portions of the Cotton Belt, explain in some measure the differences in the total man-labor requirement. The lower yields reported for the three Alabama areas will account for the lower labor requirement of those areas in contrast with that of the five districts in Georgia and South Carolina. There was considerable uniformity in the average requirements for man labor in the latter districts. The lowest average mule-labor requirement occurred in Ellis County, Tex., whereas the highest was found in Sumter County, Ga. It is interesting to note that in no less than eight districts the variation for the mule labor was but from 59 to 68 hours per acre.

FARM RECEIPTS.

In making this study it was the purpose to secure not only complete information with respect to production costs for cotton, but also to obtain a fairly complete statement of the total receipts and the major items of expense on each of these farms. (See Table XLII.)

TABLE XLII.—*Farm area, receipts, expenses,*[1] *and farm income (842 records).*

State and county.	Number of farms.	Acres per farm.	Total receipts.	Total expenses.	Farm income.
Georgia:					
Laurens County	85	172.99	$4,616	$2,076	$2,540
Greene County	78	280.06	5,217	2,267	2,950
Sumter County	80	188.16	5,513	2,699	2,814
Alabama:					
Tallapoosa County	89	203.53	1,041	648	393
Marshall County	90	58.48	1,118	594	524
Dale County	90	169.92	2,079	823	1,256
South Carolina:					
Anderson County	89	94.87	2,823	1,209	1,614
Barnwell County	91	137.36	3,920	2,021	1,899
Texas:					
Ellis County	75	167.90	7,079	2,200	4,879
Rusk County	75	145.31	2,515	951	1,564

[1] Certain minor items of expense missing.

The average total farm receipts, as reported by districts, varied from $1,041 in Tallapoosa County, Ala., to $7,079 in Ellis County, Tex. There was a range in the average total farm expenditure from $594 in Marshall County, Ala., to $2,699 in Sumter County, Ga. The individual farms in each district displayed considerable variation.

DISTRIBUTION OF FARM RECEIPTS.

Farm receipts have been divided into six groups, three of which deal with cotton. (See Table XLIII.) It is important to know the chief sources of income on the farm. When the outstanding enter-

prises are given and the returns from each enterprise are segregated as in this table, it becomes possible to study the relative importance of the various crops or by the different classes of live stock.

TABLE XLIII.—*Distribution of receipts (842 records).*

State and county.	Number of records.	Percentage of receipts from—						
		Total crops.	Cotton lint.	Cotton seed.	Total cotton.	Other crops.	Live stock.	Miscellaneous.
Georgia:								
Laurens County	85	93	77	14	91	2	3	4
Greene County	78	91	76	14	90	1	2	7
Sumter County	80	87	68	12	80	7	7	[a]6
Alabama:								
Tallapoosa County	89	81	66	9	75	6	15	4
Marshall County	90	89	83	5	88	1	4	7
Dale County	90	80	38	7	45	[b]35	15	5
South Carolina:								
Anderson County	89	95	82	13	95	.....	2	3
Barnwell County	91	98	82	13	95	3	1	1
Texas:								
Ellis County	75	97	81	12	93	4	2	1
Rusk County	75	90	74	12	86	4	5	5

[a] 2 per cent of receipts were from increase in feed and supplies in Sumter County, Ga.
[b] 33 per cent of receipts were from sales of peanuts in Dale County, Ala.

In this analysis the percentage of receipts from cotton lint and cotton seed are shown separately. These two sources of income have also been combined and the total percentage of receipts from cotton is given. There were seven districts out of ten in which the combined receipts from lint and seed cotton constituted 85 per cent or more of the total farm receipts. In these same districts the receipts from cotton seed approximated 12 to 14 per cent of the total farm receipts.

In Dale County, Ala., 35 per cent of the total farm receipts came from crops other than cotton. Thirty-three per cent of this amount was obtained from the sale of peanuts. Both Dale and Tallapoosa Counties, Ala., reported approximately 15 per cent of farm receipts as coming from the sale of live stock and live-stock products. Other crop sales and live stock together constituted 14 per cent of the farm receipts in Sumter County, Ga.

BASIC COST FACTORS.

The prominence of the man-and-mule-labor factor in the production of cotton is shown very clearly in a review of the distribution of costs as reported for the 842 farms discussed in this bulletin. The actual cost in money, figured at current rates, may be considered as of minor importance in the long run, although there is a very insistent demand for such figures. It is much more desirable to have accurate data as to the hours of man and mule labor that are required in growing an acre of cotton than to possess figures which give merely

the dollar costs for the man and mule labor. Cost data expressed in terms of money lack stability, and they are especially unreliable in periods in which extreme fluctuations occur. This has been particularly noticeable during the past three or four years. The methods of growing cotton have not changed appreciably during this period. The normal man labor requirements do not vary greatly from year to year except as they may be influenced in the individual cases of high or low yields, with resultant increase or decrease in labor requirements. It is obvious, therefore, that basic data, like hours of man and mule labor, have a much wider application in the field of farm economics and farm management than costs which are given in dollars and cents. If the acre requirements for man and mule labor are available, current rates for this labor can be applied and the costs for each class of labor per acre can be determined quite closely.

There are other reasons why more attention should be given to a study of such basic requirements as hours of man and of mule labor. During the past two years farmers have been compelled to get along with a reduced supply of man labor. A study of the man labor necessary in performing different operations in the production of cotton in widely separated districts will tend to bring the more efficient methods to the attention of the grower. By applying some of these improved practices, practically the same acreage of cotton can be handled and essentially the same yields can be obtained as formerly and with less labor. A complete story of farm practices and related costs for different areas, such as those in question, will show quite a wide range in time required for performing a given field operation. It has been pointed out that Ellis County farmers used much larger crew sizes than any of the other areas visited. This accounts in part for the comparatively low costs reported for that county. Possibly Ellis County methods can not be adapted to other districts in toto, but it is probable that some of the characteristic features of Ellis County practice can be applied to advantage by farmers in other sections.

Data on the normal seasonal labor requirements of crops are of value in any farm reorganization work. In making plans for changes in his cropping system it is useful for a farmer to know how man and mule labor is distributed throughout the season. The introduction of a new crop might so increase the peak load of labor during certain seasons that it would be impossible to care for the work which must be done. But if it is known in advance how much labor will be needed to harvest competing crops, then the acreage of each can be regulated so as to make the plan practicable.

In order to make a comparison of the results which are obtained by experiment stations, investigational committees, and other

organized bodies interested in the study of farm costs, it is exceedingly useful to have the quantity of the various materials that enter into production reported on a basis that will permit comparisons between pieces of work conducted in different periods in the same or other areas. From an accounting standpoint it is important to know the cost of manure, fertilizer, and seed, but it is equally important that the quantities which are applied or used should be determined.

There are a few cost items which must of necessity be reported on the dollar basis because cash expenditures are the only source of information and there is no opportunity to convert these sums into hours of labor or quantities of material.

The more stable factors of cost as worked out in this investigation are presented in Table XLIV for the Texas areas visited, and in Table XLV for representative areas of the older part of the Cotton Belt.

TABLE XLIV.—*Basic factors in the production of cotton (per acre) on 150 farms in Texas areas (1918 crop).*

Item.	Unit.	Ellis County, Tex.			Rusk County, Tex.		
		Average for 75 records.	Average for lowest 10.	Average for highest 10.	Average for 75 records.	Average for lowest 10.	Average for highest 10.
Man hours [1]	Hours	63	52	85	99	71	140
Mule hours	do	37	27	50	52	36	66
Manure [2]	Loads	2.48	19	4.67	29	8	50
Fertilizer	Pounds				159	96	220
Seed	Bushels	0.70	0.45	1.00	0.79	0.41	1.22
Sacks and sheets	Dollars	0.07	0.02	0.17	0.27	.13	.63
Ginning	do	1.82	1.24	2.66	1.79	1.01	3.16
Insurance and taxes	do	.44	.09	.97	.28	.09	.55
Machinery	do	1.48	.89	2.38	1.72	.88	3.33
Overhead	do	2.31	1.68	3.13	3.87	2.59	5.49
Interest and rent	do	16.83	10.75	21.14	5.15	2.28	15.73

[1] Man hours include supervision.
[2] Three farms reporting in Ellis County; two farms reporting in Rusk County.

TABLE XLV.—*Basic factors in the production of cotton (per acre) on 168 farms in Alabama and Georgia (1918 crop).*

Item.	Unit.	Marshall County, Ala.			Greene County, Ga.		
		Average for 90 records.	Average for lowest 10.	Average for highest 10.	Average for 78 records.	Average for lowest 10.	Average for highest 10.
Man hours [1]	Hours	131	91	172	150	88	187
Mule hours	do	63	44	80	63	42	82
Manure	Loads	1.02	0.23	2.64	1.02	0.16	2.74
Fertilizer	Pounds	333	200	502	260	134	454
Seed	Bushels	0.93	.57	1.40	1.18	.68	2.02
Sacks and sheets	Dollars	.25	0.08	0.76	.18	.06	0.44
Ginning	do	1.94	1.06	3.50	2.09	.99	3.49
Insurance and taxes	do	.25	.07	.69	.17	.11	.53
Machinery	do	2.63	.96	6.64	1.64	.62	3.13
Overhead	do	6.82	4.62	11.55	5.70	3.24	8.74
Interest and rent	do	9.32	2.73	26.47	7.47	2.28	19.19

[1] Man hours include supervision.

VARIATIONS IN COST AND RELATION TO PRICE.

At the beginning of such a discussion it should be clearly understood that there is not one cost of production, but, in fact, many costs of production. This is due to the variation in the producers themselves as well as in the instruments of production which they employ. This variation in the cost of production has a direct relation to prices and renders the subject more complex than has been assumed by those who have asked that the price should equal the cost of production plus a fair profit. Few people have appreciated either the wide range in cost or the significance of such a wide variation in cost. It has been assumed that most costs would be close to the average of production, and, this being the case, would facilitate the usage of the average cost to determine price. The futility of using the average in this way is shown by the accompanying charts (see fig. 13 and Table XLVI), which give the range in the cost of producing cotton. Because of this wide variation in the cost of producing cotton it does not necessarily follow that there is no relation of cost to price and therefore the cost data have no significance, for, as a matter of fact, there is an important relation of cost to price.

The first question that at once arises is what proportion of the producers in any given line of production must receive the cost of production in order to stimulate the production of the desired supply. This question can not be answered offhand for the various lines of agricultural production largely because data have not been gathered which will answer it. Neither has it been determined just how widely the costs on a given farm vary from year to year, but it is obvious that the important thing in the mind of the farmer that provides a basis for deciding whether or not a specific product is to be produced is the relation between the cost and the price through a series of years.

There are a number of other considerations which enter into a discussion of the relation of cost to price on which no authoritative data are available. It is not known to what extent farmers continue to produce at a loss through a series of years through force of custom instead of adjusting their production to the market conditions. Neither has it been determined how high a percentage of producers are just getting into farming and produce at a loss while gaining the ability to manage the farm profitably. Furthermore, it is not known what percentage of those who are now producing at a loss in a given year will drop out and be replaced by more capable farmers. All of these conditions have a direct bearing and influence on prices.

The question of what proportion of the farmers must receive the cost of production of a given crop in order that their returns shall be an adequate stimulus to further production can at this stage of our studies be no more than an off-hand guess. In the absence of

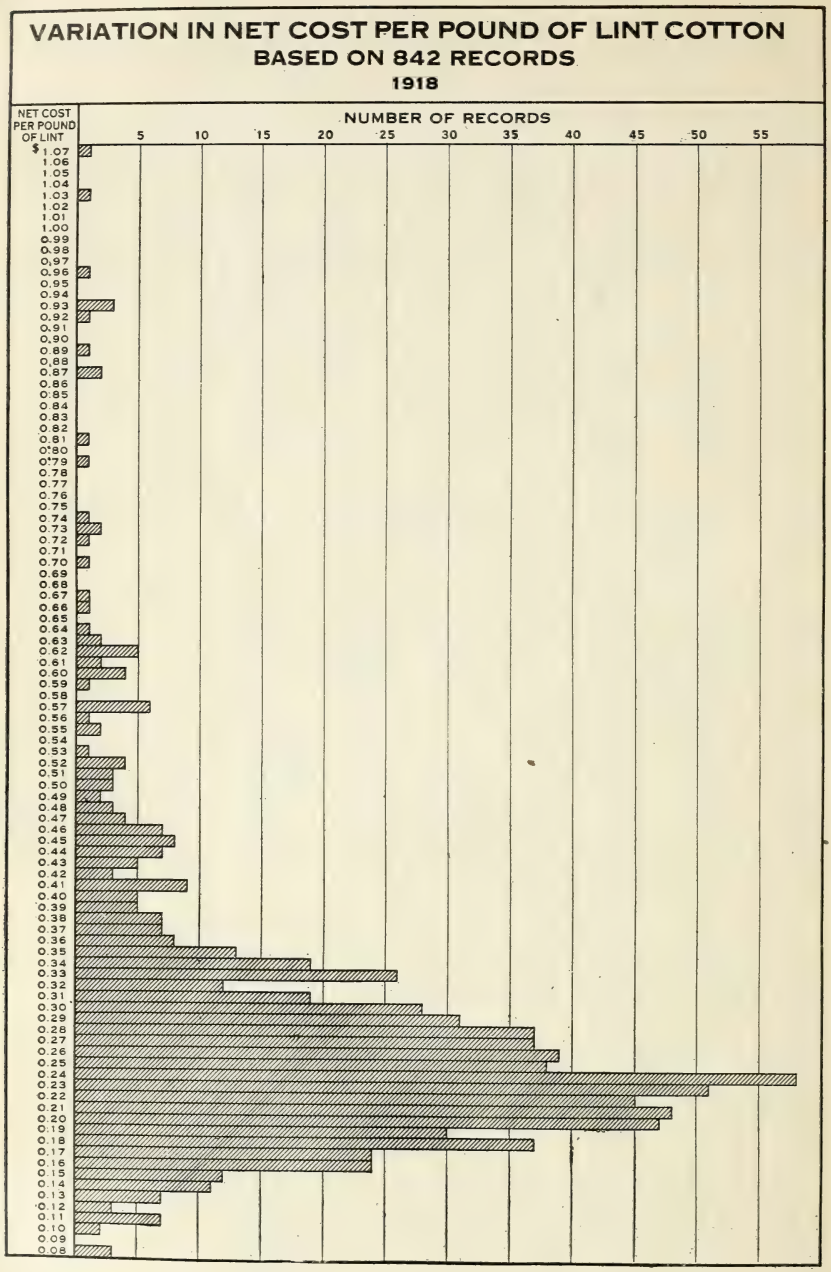

FIG. 13.—Variation in cost of cotton production on 842 farms.

sufficient data on this point in connection with the cost of producing cotton on the farms in this study, an estimate of 85 per cent of the product as the bulk-line cost was used in order to call attention to the fact that the price relation which is significant is not that of the average cost but the marginal or bulk-line cost. Further investigations will be necessary in order to obtain a satisfactory basis for estimating, with a fair degree of accuracy, the relation which will need to exist between the range of costs and the market price in order to maintain a given line of production.

TABLE XLVI.—*Variation in net cost per pound of lint, as shown by records on 842 farms (1918 crop).*

Net cost per pound of lint.	Number of farms.	Cumulative per cent of number of farms.	Acreage.		Production.	
			Total per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.
$0.08	3	0.36	35	0.10	10,200	0.13
.09	.....	.36	.....	.10	.....	.13
.10	2	.60	31	.19	12,000	.29
.11	7	1.43	161	.67	61,000	1.09
.12	3	1.79	60	.85	16,175	1.30
.13	7	2.62	256	1.62	77,430	2.32
.14	11	3.93	531	3.21	149,168	4.28
.15	12	5.35	864	5.79	306,503	8.31
.16	24	8.20	1,549	10.42	391,470	13.46
.17	24	11.05	1,213.5	14.05	266,936	16.97
.18	37	15.44	2,386	21.18	533,801	23.99
.19	30	19.00	1,487	25.62	331,842	28.36
.20	47	24.58	3,169.5	35.09	798,920	38.87
.21	48	30.28	2,229.5	41.75	529,945	45.84
.22	45	35.62	2,037.5	47.84	456,512	51.85
.23	51	41.68	2,401	55.02	526,054	58.77
.24	58	48.57	2,718	63.14	629,221	67.05
.25	38	53.08	1,956	68.99	409,286	72.44
.26	39	57.71	1,885	74.62	402,587	77.74
.27	37	62.10	1,345.5	78.64	292,190	81.58
.28	37	66.49	1,215.5	82.27	258,900	84.99
.29	31	70.17	898	84.95	202,240	87.65
.30	28	73.50	981	87.88	205,408	90.35
.31	19	75.76	377	89.01	67,130	91.23
.32	12	77.19	201	89.61	38,461	91.74
.33	26	80.28	662	91.59	156,415	93.80
.34	19	82.54	815	94.03	135,225	95.58
.35	13	84.08	283.5	94.88	55,280	96.31
.36	8	85.03	108.5	95.20	19,940	96.57
.37	7	85.86	132	95.59	22,945	96.87
.38	7	86.69	146	96.03	27,990	97.24
.39	5	87.28	51	96.18	8,300	97.35
.40	5	87.87	85	96.43	15,950	97.56
.41	9	88.94	211.5	97.06	35,540	98.03
.42	3	89.30	64	97.25	10,650	98.17
.43	5	89.89	39	97.37	6,231	98.25
.44	7	90.72	108	97.69	17,088	98.47
.45	8	91.67	105	98.00	16,734	98.69
.46	7	92.50	71	98.21	11,348	98.84
.47	4	92.98	48	98.35	9,590	98.97
.48	3	93.34	42	98.48	6,571	99.06
.49	2	93.58	13	98.52	1,775	99.08
.50	3	93.94	25	98.60	5,040	99.15

NOTE.—Fifty-one farms, representing less than 1 per cent of the cotton production having costs exceeding 50 cents per pound, are omitted because the total acreage and production for these farms represent only a small part of the totals.

Theoretically it may be claimed that the supply will readily adjust itself to changes in cost and in price, but there are undoubtedly some farm operators in the Cotton Belt who would be very reluctant to substitute other farm enterprises for cotton, since they have grown this crop for many years and they do not see clearly how they can

make a living in any other way. They will continue to produce cotton even though the returns fail to pay the wages they might obtain by hiring out and the rent they could get by letting their farms to other men.

The keeping of cost records will enable the farm operator to make frequent adjustments between the various enterprises which make up the entire farm business. Without these records, and the information which they convey, it will be impossible to single out the enterprise that is giving the lowest profit or what may perchance be taking the farm account into the loss column. A knowledge of what is happening will assist perceptibly in preventing substantial losses. Futhermore, if adjustments are made in the farm business in order to increase profits, the operators concerned will reap their rewards not so much in the gains that may be obtained in any one season, but in the greater stability of the business as a whole, and in the more uniform returns that will be apparent from year to year.

RANGE IN PRICE.

It has been pointed out that the average cost of producing cotton on the 842 farms was 23 cents per pound. The range in cost was extremely wide (8 cents to $1.07 per pound), but the bulk of the cotton was produced at a cost of 28 cents per pound or less. Considerable variation was also noted in connection with the prices these farmers received for their cotton. It was not possible to secure complete information in this regard, since when the records were taken a part of the crop was still unsold. However, in order to determine the approximate receipts from cotton, the unsold portion was valued at the price which obtained when the account was closed. The average price received by these farmers for their 1918 cotton, as computed in this way, was about 29 cents per pound. The range in prices received is shown in Table XLVII.

TABLE XLVII.—*Variation in price per pound received for cotton lint.*

[Cotton given as rent considered as sold.]

Price per pound of lint.	Pounds sold.	Cumulative per cent of production sold.	Price per pound of lint.	Pounds sold.	Cumulative per cent of production sold.
Under 20 cents	79,230	1.4	30 cents	1,634,094	77.9
20 cents	30,875	1.9	31 cents	449,495	85.7
21 cents	[a] 1,062	1.9	32 cents	450,673	93.5
22 cents	23,450	2.3	33 cents	173,684	96.5
23 cents	28,465	2.8	34 cents	83,618	97.9
24 cents	77,215	4.1	35 cents	83,104	99.3
25 cents	700,178	16.2	36 cents	34,846	99.9
26 cents	177,483	19.3	37 cents	5,250	100.0
27 cents	369,254	25.7	38 cents	[a] 525	100.0
28 cents	880,152	40.9	43 cents	[a] 1,500	100.0
29 cents	511,295	49.7			

Total cotton sold, 5,795,448 pounds, representing 76.3 per cent of production.
Total cotton held 1,804,474 pounds, representing 23.7 per cent of production.

[a] Less than one-tenth of 1 per cent.

For that portion of the 1918 crop which was actually sold from these farms prior to the time the records were taken, representing 76 per cent of their total production, there was a range in price from less than 20 cents to 43 cents per pound. Eighty per cent of the cotton sold brought prices which varied from less than 25 cents to 32 cents per pound. Only a very small percentage of the cotton sold brought less than 23 cents per pound, which was the average cost of producing cotton on these farms.

APPENDIX.

TABLE 1a.—*Variation in cost of producing cotton (net cost per pound of lint) on 85 farms in Laurens County, Ga.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.10	19	0.5	8,500	0.8	*
.11	78	2.5	37,700	4.2	***
.12	12	2.8	3,850	4.6	*
.13	35	3.7	13,000	5.8	*
.14	121	6.7	39,500	9.4	***
.15	56	8.1	20,400	11.3	**
.16	151	11.9	37,750	14.7	***
.17	59	13.4	12,500	15.8	**
.18	347	22.1	96,725	24.6	******
.19	122	25.2	31,750	27.5	**
.20	418	35.7	156,000	41.7	*******
.21	560	49.8	163,500	56.6	**********
.22	203	54.9	51,015	61.2	******
.23	71	56.7	25,000	63.5	**
.24	397	66.7	99,500	72.5	******
.25	500	79.3	112,500	82.7	*****
.26	177	83.8	44,815	86.8	*******
.27	241	89.9	57,100	92.0	*****
.28	108	92.6	29,130	94.6	****
.29	183	97.2	35,000	97.8	***
.30	20	97.7	5,500	98.3	*
.31	.....	97.7	.....	98.3	.....
.32	.....	97.7	.....	98.3	.....
.33	.....	97.7	.....	98.3	.....
.34	25	98.3	6,500	98.9	*
.35	15	98.7	3,600	99.2	*
.36	.....	98.7	.....	99.2	.....
.37	20	99.2	3,000	99.5	*
.38	.....	99.2	.....	99.5	.....
.39	.....	99.2	.....	99.5	.....
.40	30	100.0	5,700	100.0	*
	3,968	100.0	1,099,535	100.0	85

The lowest cost on these farms was 10 cents and the highest 40 cents per pound. The average cost for the 85 farms was 21 cents per pound. Essentially 50 per cent of the acreage and 56.6 per cent of the total amount of cotton was produced at a cost of 21 cents per pound or less. A price of 26 cents per pound would be necessary to meet cost of 83.8 per cent of the acreage and 86.8 per cent of the production on these farms. Average yield, 277 pounds per acre, the lowest individual yield being 105 pounds, and the highest 560 pounds.

The average yield of cotton per acre, as reported for the various cotton-growing States, was appreciably lower in 1919 than in 1918. Labor and fertilizer costs were higher in 1919 than in 1918, which indicates that the average cost per pound of cotton was considerably higher for 1919 than for the preceding year. How these factors affected the cost on the individual farms will be determined by a further study on these farms covering the 1919 crop.

TABLE 2a.—*Variation in cost of producing cotton (net cost per pound of lint) on 78 farms in Greene County, Ga.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.08	13	0.3	3,500	0.3	*
.09	.....	.3	.....	.3	.....
.10	.....	.3	.....	.3	.....
.11	.....	.3	.....	.3	.....
.12	.....	.3	.....	.3	.....
.13	.....	.3	.....	.3	.....
.14	.....	.3	.....	.3	.....
.15	175	4.5	72,500	7.0	**
.16	214	9.7	74,155	13.7	***
.17	116	12.5	33,625	16.8	***
.18	79	14.4	29,670	19.6	***
.19	82	16.4	19,420	21.4	****
.20	802½	35.8	205,250	40.5	********
.21	140	39.2	46,600	44.8	**
.22	270	45.7	82,325	52.4	****
.23	437	56.2	102,115	61.9	******
.24	353	64.7	89,250	70.2	******
.25	164	68.7	38,550	73.8	****
.26	283	75.5	70,150	80.3	******
.27	290	82.5	61,950	86.1	******
.28	131	85.7	26,650	88.6	****
.29	246	91.6	53,100	93.5	******
.30	127	94.7	26,700	96.0	***
.31	25	95.3	4,000	96.4	*
.32	.....	95.3	.....	96.4	.....
.33	43	96.3	9,000	97.2	*
.34	118	99.1	23,350	99.4	***
.35	.....	99.1	.....	99.4	.....
.36	30	99.8	4,000	99.8	*
.37	.....	99.8	.....	99.8	.....
.38	.....	99.8	.....	99.8	.....
.39	.....	99.8	.....	99.8	.....
.40	.....	99.8	.....	99.8	.....
.41	9	100.0	2,000	100.0	*
	4,147½	100.0	1,077,860	100.0	78

There was a range in production costs on these farms of from 8 cents to 41 cents per pound. The average cost for the 78 farms was 22 cents per pound. Farm operators who had a cost of 22 cents per pound or less cultivated 45.7 per cent of the cotton acreage and produced 52.4 per cent of the total cotton. It would require a price of 27 cents per pound to care for 82.5 per cent of the acreage and 86.1 per cent of the production. Average yield, 260 pounds; range of yields per farm from 133 pounds to 450 pounds.

TABLE 3a.—*Variation in cost of producing cotton (net cost per pound of lint) on 80 farms in Sumter County, Ga.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.11	50	1.2	15,000	1.5	*
.12	----------	1.2	----------	1.5	----------
.13	165	5.1	46,680	6.1	***
.14	148	8.6	44,000	10.4	**
.15	520	21.0	171,900	27.2	***
.16	276	27.6	78,000	34.8	**
.17	75	29.4	26,000	37.3	**
.18	463	40.5	111,950	48.2	**********
.19	277	47.1	67,460	54.8	******
.20	287	54.0	72,185	61.9	******
.21	333	62.0	70,100	68.8	******
.22	206	66.9	47,480	73.4	****
.23	67	68.5	13,000	74.7	**
.24	352	76.9	78,500	82.4	******
.25	174	81.1	25,500	84.9	***
.26	246	87.0	48,000	89.6	*****
.27	211	92.1	43,500	93.9	*****
.28	----------	92.1	----------	93.9	----------
.29	97	94.4	22,500	96.1	**
.30	56½	95.7	8,500	96.9	**
.31	14	96.0	2,250	97.1	*
.32	----------	96.0	----------	97.1	----------
.33	117	98.8	19,350	99.0	***
.34	----------	98.8	----------	99.0	----------
.35	17	99.2	3,605	99.3	*
.36	10	99.4	1,750	99.5	*
.37	----------	99.4	----------	99.5	----------
.38	27	100.0	5,000	100.0	*
	4,188½	100.0	1,022,210	100.0	80

There was a range in production costs on these farms of from 11 cents to 38 cents per pound. The average cost for 80 farms was about 20 cents per pound. If the price had been fixed at the latter point, 46 per cent of the acreage and 38.1 per cent of the cotton would have been produced at a loss. A price of 25 cents per pound would include 85 per cent of the total production in this group. Average yield, 244 pounds; range of yields per farm, from 112 pounds to 469 pounds.

TABLE 4a.—*Variation in cost of producing cotton (net cost per pound of lint) on 89 farms in Tallapoosa County, Ala.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.16	17	1.5	5,215	2.6	**
.17	----------	1.5	----------	2.6	----------
.18	----------	1.5	----------	2.6	----------
.19	6	2.0	1,462	3.3	*
.20	72	8.2	16,435	11.5	***
.21	----------	8.2	----------	11.5	----------
.22	15	9.5	2,500	12.7	**
.23	89	17.1	21,696	23.5	***
.24	117	27.1	20,200	33.5	****
.25	19	28.7	3,775	35.4	**
.26	----------	28.7	----------	35.4	----------
.27	17	30.2	3,320	37.1	**
.28	78	36.9	13,750	43.9	***
.29	63	42.3	12,470	50.1	***
.30	43	46.0	8,500	54 3	**
.31	30	48.6	3,550	56.1	**
.32	25	50.7	3,750	58.0	**
.33	31	53.4	5,915	60. 9	***
.34	25	55.5	3,500	62 6	*
.35	7	56.1	980	63.1	*
.36	15½	57.4	3,250	64.7	**
.37	14	58.6	2,200	65.8	*
.38	28	61.0	4,130	67.9	**
.39	23	63.0	3,000	69.4	**
.40	----------	63.0	----------	69.4	----------
.41	21	64.8	3,500	71.1	*
.42	55	69.5	8,500	75.3	**
.43	10	70.4	1,857	76.2	**
.44	25	72.5	3,000	77.7	**
.45	32	75.2	4,054	79.7	**
.46	5	75.6	900	80.1	*
.47	29	78.1	4,375	82.3	**
.48	22	80.0	4,071	84.3	**
.49	----------	80.0	----------	84.3	----------
.50	17	81.5	4,040	86.3	**
.51	25	83.6	3,000	87.8	*

There was a range in production costs on the farms visited in this district of from 16 cents to $1.07 per pound of lint. Twenty-four farm operators had costs which varied from 51 cents to $1.07 per pound. This group represented only 16.4 per cent of the acreage and 12.2 per cent of the production and is not shown in the above table. The average cost per pound of lint was about 36 cents per pound for all farms. Average yield, 172 pounds; range of yields per farm, from 73 pounds to 375 pounds. To cover 84 per cent of the cotton grown on these farms would require a price of 48 cents per pound.

TABLE 5a.—*Variation in cost of producing cotton (net cost per pound of lint) on 90 farms in Marshall County, Ala.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.11	10	0.8	1,250	0.4	*
.12	.....	.8	.....	.4	.....
.13	.....	.8	.....	.4	.....
.14	.....	.8	.....	.4	.....
.15	.....	.8	.....	.4	.....
.16	.....	.8	.....	.4	.....
.17	12½	1.8	5,010	2.2	**
.18	.....	1.8	.....	2.2	.....
.19	10	2.6	3,150	3.3	*
.20	.....	2.6	.....	3.3	.....
.21	8	3.2	2,000	4.0	*
.22	22½	5.0	6,450	6.3	***
.23	15	6.2	4,500	7.9	*
.24	65	11.4	16,200	13.6	***
.25	14	12.5	4,500	15.2	**
.26	25	14.5	6,500	17.5	*
.27	30½	16.9	8,000	20.3	**
.28	107	25.5	26,604	29.7	******
.29	91	32.8	25,070	38.5	******
.30	106½	41.3	24,775	47.3	*****
.31	59½	46.1	12,470	51.7	*****
.32	44	49.6	10,805	55.5	***
.33	97	57.4	29,910	66.1	******
.34	108	66.0	19,000	72.8	*****
.35	44½	69.6	9,245	76.1	****
.36	8	70.2	1,500	76.6	*
.37	.....	70.2	.....	76.6	.....
.38	20	71.8	4,360	78.1	*
.39	23	73.6	4,500	79.7	**
.40	17	75.0	4,000	81.1	**
.41	55	79.4	11,040	85.0	****
.42	9	80.1	2,150	85.8	*
.43	21	81.8	3,500	87.0	**
.44	34	84.5	5,588	89.0	***
.45	42	87.9	6,750	91.4	***
.46	40	91.1	5,850	93.5	**
.47	12	92.1	2,215	94.3	*
.48	20	93.7	2,500	95.2	*
.49	10	94.5	1,250	95.6	*

There was a range in the production costs on the farms visited in this county of from 11 cents to 62 cents per pound. Eight farms having costs which varied from 51 cents to 62 cents per pound are not shown in the above table. This group represents but 5.5 per cent of the total acreage and 4.4 per cent of the total production. The average cost per pound of lint for all farms was 33 cents. Average yield, 227 pounds; range in yields per farm, from 125 pounds to 457 pounds. A price of 41 cents per pound would be required to meet production costs on 85 per cent of the cotton.

TABLE 6a.—*Variation in cost of producing cotton (net cost per pound of lint) on 90 farms in Dale County, Ala.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.08	5	0.4	2,200	0.9	*
.09	----------	.4	----------	.9	----------
.10	12	1.4	3,500	2.4	*
.11	23	3.3	7,050	5.4	**
.12	----------	3.3	----------	5.4	----------
.13	----------	3.3	----------	5.4	----------
.14	14	4.3	3,800	7.0	**
.15	10	5.1	2,200	7.9	*
.16	----------	5.1	----------	7.9	----------
.17	48	9.0	13,500	13.6	**
.18	53	13.3	16,250	20.4	**
.19	75	19.4	21,500	29.4	*
.20	13	20.5	2,880	30.6	**
.21	68½	26.1	15,165	37.0	****
.22	72	32.0	12,150	42.1	***
.23	58	36.7	10,550	46.5	****
.24	72	42.6	11,673	51.4	****
.25	40	45.9	11,700	56.3	**
.26	35	48.8	6,770	59.2	****
.27	25	50.8	4,150	61.0	***
.28	12	51.8	2,000	61.8	*
.29	16	53.1	4,030	63.5	**
.30	27	55.3	4,800	65.5	*
.31	96	63.1	14,500	71.6	***
.32	17	64.5	2,861	72.8	**
.33	68	70.1	12,590	78.1	****
.34	45	73.8	5,500	80.4	**
.35	30	76.2	6,350	83.1	**
.36	21	77.9	2,940	84.3	**
.37	8	78.6	1,620	85.0	*
.38	12	79.6	2,000	85.8	*
.39	5	80.0	800	86.1	*
.40	22	81.8	2,500	87.2	*
.41	12½	82.8	2,000	88.0	*
.42	----------	82.8	----------	88.0	----------
.43	8	83.5	874	88.4	*
.44	18	85.0	2,500	89.5	*
.45	17	86.4	4,250	91.3	**
.46	16	87.7	2,098	92.2	***

In this district there was a range in production costs of from 8 cents to 93 cents per pound. Eighteen farms which are not included in Table 6a had costs from 49 cents to 93 cents per pound; these farms represented 12.3 per cent of the cotton acreage and 7.8 per cent of the production for the 90 farms. The average cost for all farms in this group was practically 28 cents per pound. Average yield, 194 pounds; range of yields per farm, from 69 pounds to 467 pounds. In this district a price of 37 cents per pound would be required to cover production costs on 85 per cent of cotton.

TABLE 7a.—*Variation in cost of producing cotton (net cost per pound of lint) on 89 farms in Anderson County, S. C.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.08	17	0.6	4,500	0.6	*
.09	.....	.6	.....	.6	.....
.10	.....	.6	.....	.6	.....
.11	.....	.6	.....	.6	.....
.12	.....	.6	.....	.6	.....
.13	18	1.2	7,500	1.7	*
.14	.....	1.2	.....	1.7	.....
.15	.....	1.2	.....	1.7	.....
.16	65	3.5	20,500	4.6	*
.17	54	5.4	12,750	6.4	**
.18	108	9.2	29,000	10.5	***
.19	43	10.7	10,850	12.0	**
.20	100	14.2	25,050	15.5	***
.21	96	17.6	28,500	19.5	***
.22	.....	17.6	.....	19.5	.....
.23	303	28.2	77,500	30.4	*********
.24	209	35.5	55,000	38.2	******
.25	252	44.3	65,400	47.4	******
.26	409	58.6	86,850	59.6	***
.27	103	62.2	32,125	64.1	***
.28	218	69.8	53,855	71.7	********
.29	111	73.7	29,570	75.9	*****
.30	125	78.1	27,100	79.7	*****
.31	53½	80.0	14,000	81.7	**
.32	58	82.0	13,000	83.5	*
.33	121	86.2	28,650	87.5	*****
.34	107	89.9	28,000	91.4	***
.35	120	94.1	21,000	94.4	***
.36	24	94.9	6,500	95.3	*
.37	15	95.4	3,000	95.7	*
.38	59	97.4	12,500	97.5	**
.39	.....	97.4	.....	97.5	.....
.40	16	97.9	3,750	98.0	*

In this district production costs ranged from 8 cents to 51 cents per pound. Three farms having unit costs of 44, 46, and 51 cents are not shown in the table. The average cost for the 89 farms was 26 cents per pound. If the price had been fixed for this district at 26 cents per pound, 41.4 per cent of the acreage and 40.4 per cent of the cotton grown by these operators would have been produced at a loss. Average yield 240 pounds; range of yield per farm, from 150 pounds to 417 pounds.

TABLE 8a.—*Variation in cost of producing cotton (net cost per pound of lint) on 91 farms in Barnwell County, S. C.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.12	18	0.5	5,500	0.5	*
.13	.....	.5	.....	.5	.....
.14	23	1.1	7,968	1.3	*
.15	103	3.7	39,503	5.0	****
.16	50	5.0	11,750	6.1	**
.17	.....	5.0	.....	6.1	.....
.18	171	9.3	39,680	9.9	***
.19	138	12.8	37,000	13.4	**
.20	187	17.6	48,500	18.0	*****
.21	187	22.4	57,700	23.5	*****
.22	374	31.9	108,000	33.8	*******
.23	486	44.2	135,970	46.7	**********
.24	575	58.8	156,786	61.6	*********
.25	191	63.7	51,500	66.5	****
.26	264	70.4	73,200	73.4	*****
.27	75	72.3	25,500	75.8	***
.28	204½	77.5	47,250	80.3	*****
.29	71	79.3	17,500	82.0	**
.30	281	86.4	78,000	89.4	*****
.31	61	87.9	11,000	90.4	**
.32	41	88.9	6,500	91.0	**
.33	160	93.0	47,500	95.5	*
.34	15	93.4	2,000	95.7	*
.35	50	94.7	10,500	96.7	*
.36	.....	94.7	.....	96.7	.....
.37	75	96.6	13,125	97.9	***
.38	.....	96.6	.....	97.9	.....
.39	.....	96.6	.....	97.9	.....
.40	.....	96.6	.....	97.9	.....
.41	114	99.5	17,000	99.5	**
.42	.....	99.5	.....	99.5	.....
.43	.....	99.5	.....	99.5	.....
.44	.....	99.5	.....	99.5	.....
.45	14	99.8	1,680	99.7	*
.46	.....	99.8	.....	99.7	.....
.47	7	100.0	3,000	100.0	*
	3,935½	100.0	1,053,612	100.0	91

The range in production costs for the farms studied in this district was from 12 cents to 47 cents per pound of lint. The average cost for 91 farms was 24 cents per pound. A price of 29 cents per pound would care for 79.3 per cent of the acreage and 82 per cent of the cotton produced on these farms. In other words, at 29 cents per pound 69 farmers would make a profit, 2 operators would break even, and 20 men would grow cotton at a loss. Average yield, 268 pounds; range of yields per farm, from 120 pounds to 462 pounds.

TABLE 9a.—*Variation in cost of producing cotton (net cost per pound of lint) on 75 farms in Ellis County, Tex.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.14	115	1.4	23,400	1.6	*
.15	.....	1.4	.....	1.6	.....
.16	733	10.4	153,875	12.3	*********
.17	694	18.9	130,545	21.4	*****
.18	1,135	32.8	206,026	35.7	*********
.19	656	40.9	123,480	44.3	*******
.20	1,042	53.7	202,020	58.3	********
.21	713	62.4	120,210	66.7	*******
.22	579	69.5	91,818	73.1	******
.23	720	78.3	110,393	80.8	********
.24	375	82.9	65,872	85.4	***
.25	430	88.2	68,547	90.2	****
.26	180	90.4	29,445	92.2	**
.27	242	93.4	36,000	94.7	***
.28	154	95.3	27,486	96.6	*
.29	.....	95.3	.....	96.6	.....
.30	80	96.3	9,533	97.3	*
.31	.....	96.3	.....	97.3	.....
.32	.....	96.3	.....	97.3	.....
.33	.....	96.3	.....	97.3	.....
.34	300	100.0	39,375	100.0	*
	8,148	100.0	1,438,025	100.0	75

The range in production costs on these farms was from 14 cents to 34 cents per pound of lint. The average cost for all farms was 20.5 cents per pound. A little over 58 per cent of the total cotton on 53.7 per cent of the acreage was produced at or below an average cost. It would require a price of 24 cents to cover the cost of 85.4 per cent of the total production of these farms. Average yield, 176 pounds of lint; range of yields per farm, from 100 pounds to 288 pounds.

TABLE 10a.—*Variation in cost of producing cotton (net cost per pound of lint) on 75 farms in Rusk County, Tex.*

Cost per pound of lint.	Acreage.		Production.		Farms in each cost group (each star one farm).
	Acres per group.	Cumulative per cent.	Total pounds per group.	Cumulative per cent.	
$0.12	30	1.2	6,825	1.4	*
.13	38	2.7	10,250	3.6	**
.14	110	7.0	30,500	10.0	**
.15	.....	7.0	.....	10.0	.....
.16	43	8.7	10,225	12.2	**
.17	155	14.7	33,006	19.1	*****
.18	30	15.9	4,500	20.1	*
.19	78	18.9	15,770	23.4	****
.20	248	28.5	70,600	38.2	***
.21	124	33.3	26,170	43.7	*****
.22	296	44.8	54,774	55.2	**********
.23	155	50.8	25,330	60.5	*****
.24	203	58.7	36,240	68.1	*******
.25	172	65.4	27,314	73.8	*****
.26	266	75.8	36,857	81.6	*****
.27	111	80.1	20,545	85.9	****
.28	203	88.0	32,175	92.7	***
.29	20	88.8	3,000	93.3	*
.30	115	93.3	12,000	95.8	**
.31	38	94.8	5,360	96.9	**
.32	16	95.4	1,545	97.2	*
.33	25	96.4	3,500	98.0	*
.34	72	99.2	8,000	99.7	**
.52	20	100.0	1,590	100.0	*
	2,568	100.0	476,076	100.0	75

Production costs on the 75 Rusk County farms varied from 12 cents to 52 cents per pound. The farm operators who had an average cost of 22 cents or less harvested 44.8 per cent of the acreage and 55.2 per cent of the total cotton for the entire group. It would require a price of 27 cents per pound to care for 85.9 per cent of the production. Average yield, 185 pounds; range in yield per farm, from 80 pounds to 321 pounds.

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